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Chicago Transit Authority
General Operations Division
Engineering Department
Equipment Engineering
June 1980



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CHICAGO TRANSIT AUTHORITY

BUS SERIES 7000 - 7019

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CHICAGO TRANSIT AUTHORITY
GENERAL OPERATIONS DIVISION
ENGINEERING DEPARTMENT
EQUIPMENT ENGINEERING

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CHICAGO TRANSIT AUTHORITY

BUS SERIES 7000 - 7019

CTA SPECIFICATION ABC - 1

INFORMATION PERTAINING TO AIR-CONDITIONED ARTICULATED COACHES

Bus Manufacturer	AM General Corporation Machinen Fabrik Augsburg Nurnberg (MAN)
Model Number	SG 220-10255
Seating Capacity	64 Passengers
Number of Coaches	20
Date Received	March 1979
Bid Price	\$171,648.55 Per Coach
Height	124-1/8"
Width	102"
Length over Bumpers	660-5/8"
Horizontal Hinge Angle	31°
Vertical Hinge Angle	11°
Body Turning Radius	41.41
Weight	36,400 lbs.
Wheel Base	
Front Axle to Drive Axle	222-7/16"
Drive Axle to Trailer Axle	255-1/2"
Body Overhang Including Bumper	
Front	105"
Rear	77-3/8"
Wheelhousings	Stainless Steel
Stepwells	Stainless Steel

INFORMATION PERTAINING TO AIR-CONDITIONED ARTICULATED COACHES - Continued

Rear Axle (Trailer)

Manufacturer MAN A.G. West Germany

Model V7-70

Drive Axle Final Ratio 5.22.16

Engine (Coach)

Manufacturer MAN A.G. West Germany
Horizontal Six Cylinder
in Line Turbo Charged

Model D 2566 MTUM/US

Horsepower Net 280 at 2200 RPM

Diesel Fuel Capacity 100 Gal.

Alternator Delco Remy Series 50 DN

Type 600, 28V/270Amp

Air Compressors

Manufacturer MAN

Type (18.3 cu. in.) One Cylinder
Water-Cooled, 2 Compressors
Total CFM 26.8 at 2000 RPM

Power Steering

Manufacturer ZF 8065

Type Gear

Relief Pressure 1425 psi

Transmission with Two Stage Retarder

Manufacturer Renk

Model 874

Auxiliary Heater

Manufacturer Webasto

INFORMATION PERTAINING TO AIR-CONDITIONED ARTICULATED COACHES - Continued

Tires

Manufacturer	Goodyear
Type	Tube, Bias Ply
Size	Hi-Miler 12.0x22.0 G 8 Series, 55 MPH Rating

Air-Condition Drive Engine

Manufacturer	Perkins
Type	Diesel 4 Cylinder in Line 4.1254
Horsepower	SAE Net 62 3000 RPM
Constant Speed	2200 RPM
A/C Compressor	
Manufacturer	Trane, Inc.
Model	GB
Refrigerant	Freon 22
Coach Capacity	37 lbs.
A/C Alternator	
Manufacturer	Niehoff
Type	N 1302-1
Batteries (Main)	
Coach	Mfg. Gould 12 Volt
Model	Solid Cover
Batteries A/c	
Manufacturer	Delco
Type	Maintenance Free 12 Volt
Lighting Interior	Fluorescent
Manufacturer	Luminator
Ballast	Triad-Utrad
Lens Material	Polycarbonate

COMPONENT INDEX

EXTERIOR PHOTOS AND VARIOUS COMPONENTS AS VIEWED WITH ACCESS DOORS OPEN

PHOTO
NUMBER

- 1 Front view of coach with driver's heater access door closed
- 2 Front view with heater access door open
 - 1) Alcohol evaporator
 - 2) Driver's heater coolant return line
 - 3) Driver's heater coolant supply line
 - 4) Heater core air bleed valve
 - 5) Transmission kickdown switch assembly
 - 6) Accelerator linkage bell crank
 - 7) Service brake application valve with micro switches to actuate transmission retarder
 - 8) Power steering gear assembly
- 3 Left front corner headlight door open
 - 9) A/C hour meter
 - 10) A/C ambient temperature thermostat switch
- 4 Left headlight with resistor
 - 11) Resistor to reduce voltage from 24 volts to 12 volts
- 5 Enlarged view left side driver's heater door open Accelerator interlock cylinder (not shown) installed behind and bottom of bell crank #6
- 6 Enlarged view right side driver's heater door open
- 7 Rear view of coach A/C access door closed
- 8 Rear view A/C door open
- 9 Left side oblique view
- 10 Left side view entire coach
- 11 Left side view entire coach in left turn condition
- 12 Side view left front main electrical junction box door closed

PHOTO
NUMBER

13 Side view left front main electrical junction box door open

14 Enlarged view main electrical junction box

13) Transmission printed circuit control box

14) Turn indicator unit

15) Engine hot coolant warning switch

16) Drivers air tube from blower in heat duct
to console with adjustable air outlet

Relay Identification Left to Right

- a) Turn signal
- b) Turn signal
- c) Alternator discharge warning light
- d) 12-volt radio circuit
- e) Horn
- f) Reverse lamps
- g) Turn signal indicator
- h) Interior lighting
- i) Interior lighting
- j) Coolant heater (auxiliary)
- k) Spring brake interlock
- l) Spring brake interlock
- m) Engine fast idle
- n) Passenger signal

Left Bottom Corner

- o) Fare Box
- p) Driver's blower
- q) Entrance Door
- r) Public address
- s) Radio

15 Left side view of battery, voltage regulator and auxiliary coolant
heater compartment access doors closed

16 Left side view engine oil dip stick and filler pipe access door open

17) Oil filler pipe

18) Engine dip stick

17 Enlarged view of engine oil filler pipe and dip stick

18 Voltage regulator compartment enlargement

19) Battery equalizer

20) Voltage regulator

21) Webasto auxiliary coolant heater control relays
and bi-metal switches

18 Voltage regulator compartment enlargment - cont'd.

22) Engine starting motor relay
23) Heater box blower motor 160 amp master circuit breaker
aa) 12 volt radio circuit breaker
bb) Coach main circuit breaker

Relays Left to Right

- 1) Front pump
- 2) Rear pump
- 3) A/C
- 4) Start internal
- 5) Engine Stop
- 6) Stop light

Circuit Breakers Beneath Relays Left to right

- 1) Front pump
- 2) Rear pump
- 3) Engine cold start
- 4) Engine compartment lights
- 5) Fare box

19 Side view battery, voltage regulator and auxiliary heater compartment doors open

24) Webasto heater controls
25) Combustion Chamber with water jacket
26) Fuel oil filter

20 Enlarged view auxiliary heater

21 Left side bellows coach straight position

22 Left rear A/C unit air inlet

23 Right side entire view of coach

24 Right side oblique view

25 Right side bellow coach straight ahead

26 Right side of coach in left turn position

27 Left side bellows coach in right turn position

28 Left side coach in right turn position

- 29 Right side bellows coach in right turn position
- 30 Right side bellows coach in right turn position
- 31 Entrance doors closed
- 32 Entrance doors open
- 33 Stepwell entrance doors open
- 34 Right side view of surge tank and engine compartment doors closed
- 35 Engine compartment door open
- 36 Enlarged photo engine compartment door open
 - 27) Power Steering oil lines from reservoir
 - 28) Engine emergency shut down fuel solenoid
 - 29) Manual fuel pump
 - 30) Engine fuel filters
 - 31) Engine air intake to filters
 - 32) Engine air filters
 - 33) Engine air filter restriction indicator
- 37 Surge tank door open
- 38 Enlarged view surge tank door open
 - 34) Power steering oil reservoir
 - 35) Engine coolant filler pipe
 - 36) Engine coolant automatic pressure relief valve
- 39 Exit doors closed
- 40 Exit doors open
- 41 Exit door stepwell doors open
- 42 Right rear A/C engine air intake and A/C compressor access door closed
- 43 A/C compressor access door open
- 44 Enlarged view of A/C compressor door open right side
 - 37) Location of engine air cleaner
 - 38) A/C compressor
 - 39) A/C engine final fuel filter
 - 40) A/C compressor high head pressure switch
 - 41) Batteries for A/C

PHOTO
NUMBER

45 Enlarged view fuel tank filler pipe right side of trailer

STRUCTURE PHOTOS

46 Front suspension assembly

47 Chassis structure (partial)

48 Completed chassis structure prior to collector installation

49 Top view structure farebox and stepwell area

50 Entrance door stepwell structure

51 Farebox and stepwell

52 Side structure prior to collector installation

53 Roof structure

54 All component structures in collector for welding

55 Left front wheelhousing structure

42) Front axle brake reservoir

43) Front axle brake reservoir

44) Drive axle brake reservoir

56 Right rear tractor chassis structure

45) Leveling valve

57 Left rear tractor chassis structure

46) Leveling valve

58 Drive axle wheelhousing structure

59 Tractor body structure completed welding

47) Heater return line from trailer

48) Heater supply line to trailer

60 Left side structure view welded completely

A/C ASSEMBLY BEFORE AND AFTER INSTALLATION

61 Bulkhead side before installation

49) A/C alternator
50) A/C alternator voltage regulator
51) A/C engine fuel pump
52) A/C refrigerant hot gas by pass valve
53) Primary fuel filter
54) A/C engine air filter restriction indicator

62 Enlarged view of Items 51-52-53

63 Enlarged view of Items 49-50-54 A/C engine

64 Enlarged view A/C alternator voltage regulator

65 Enlarged view of A/C compressor

66 A/C engine coolant and refrigerant condenser cores

55) Condenser core
56) Coolant core

67 Coolant and condenser core

68 Air inlet side of coolant and condenser cores

69 A/C control electrical box

57) Low water engine shut down switch
58) Speed sensor
59) 60 second time delay
60) CR2 solenoid switch
61) CR3 solenoid switch
62) PR2 solenoid switch
63) ARI relay
64) CRI relay
65) CR4 relay
66) CR5 relay
67) CR6 relay
68) Ten second time delay

70 A/C unit assembly installed and access door open

71 A/C unit coolant temperature, and engine oil pressure gauge

69) Coolant automatic pressure relief valve
70) Coolant reservoir fill cap

DRIVE AXLE AND SUSPENSION

72 Axle installed in suspension frame

73 Axle with brake chambers

71) Air line to service brake chamber

72) Park brake release air line

73) Air line to service brake with air psi check

74 Front view drive axle

75 Drive axle with air valves

74) Pressure protection valve

75) Drive shaft U joint

76) Service brake stoplight switch

76 Drive axle brake chambers

77) Service brake chamber

78) Spring applied park brake chamber

77 Enlarged view brake chambers and air lines

78 Drive axle suspension frame air spring beam

79) Left side leveling valve link

80) Right side leveling valve link

79 Right side suspension air spring, shock absorber, leveling valve and link

81) Shock absorber

80 Left side suspension air spring, shock absorber, and leveling valve link

82) Shock absorber

STEERING AXLES TRACTOR FRONT AND TRAILER

81 Installation lower control arms

82 Tractor left side front view of suspension

83) Steering drag link

83 Tractor left side rear view of suspension

84 Trailer left side rear view of suspension

STEERING AXLES TRACTOR FRONT AND TRAILER - Cont'd.

85 Trailer left side front view of suspension

86 Left side trailer air suspension reservoir

84) Air reservoir

87 Trailer right side front view of suspension

88 Trailer right side rear view of suspension

85) Leveling valve

86) Leveling valve link

89 Trailer right side air suspension reservoir

87) Air reservoir

90 Tractor right side rear view of suspension

88) Leveling valve

89) Leveling valve link

91 Tractor right side front view of suspension

92 Enlarged view upper and lower control arms right side rear view of tractor

93 Enlarged view power steering unit chassis mounted

90) Power steering unit

91) Quick change coupling power steering pressure check point

92) Park brake warning light switch

93) Front air pressure warning indicator light switch

94) Rear air pressure warning indicator light switch

INTERIOR OF COACH BEING MANUFACTURED

94 Top view of horizontal hinge angle warning switch

95) Switch with ramps

95 Interior ceiling driver's area

96) Driver's light

96 Interior of coach before roof insulation

INTERIOR OF COACH BEING MANUFACTURED - Cont'd.

97 Tractor ceiling before insulation

98 Trailer roof with insulation and melamine ceiling panels installed

99 Interior of coach with ceiling panels, floor covering and seat rails installed both floor and wall

100 Left side tractor shock bracket, and access holes for removing air suspension nuts

97) Shock bracket

98) Access holes

101 Right side drive axle shock bracket

102 Right side tractor shock bracket, and access holes for removing air suspension nuts

103 Left side drive axle shock bracket

104 Trailer heater box left side with inlet and outlet openings

101) Fresh and recirculated air inlet

105 Access door to fuel tank fittings and valves

102) Fuel tank access

106 Location of driver's air blower behind console

103) Exact location with wire

TOP VIEW OF ENGINE, TRANSMISSION, HEATER BOXES AND FUEL TANK BEFORE PLYWOOD FLOOR INSTALLATION

107 Enlarged view front of engine and fan shroud

104) Belt driven air compressor

105) Belt tension adjusting idler pulley

106) Engine coolant fan

107) Radiator and fan shroud

108 Top view of air compressors and piping

108) Gear driven air compressor

00) Power steering pump

TOP VIEW OF ENGINE, TRANSMISSION, HEATER BOXES AND
FUEL TANK BEFORE FLOOR COVERING - Cont'd.

109 Top rear view of engine

109) Engine crankcase breather
110) Engine oil pressure, coolant temperature gauge
and compartment light switch
111) Engine shutdown cylinder
112) Final engine fuel filter
113) Engine fuel injection pump
114) Fuel lines to engine cold start plugs

110 A/C refrigerant flex line routing over turbo charger both
pressure and suction, to tractor evaporators

115) Lines pressure and suction

111 Front to rear view of engine assembly

112 Rear to front view of transmission and engine assembly

116) Transmission breather and fill cap
117) Transmission oil dip stick to check level

113 Top view transmission

118) Transmission oil filter

114 Heater box installation left side trailer

115 Top and side view heater box with electrical connections for
blower motor

116 Fuel tank

117 Fuel lines at trailer bulkhead for A/C engine

119) Fuel supply line shut off valve
120) Fuel return line shut off valve

118 Muffler location

121) Muffler heat baffle

119 Heater lines and radiator fan shroud

120 Top view engine coolant auxiliary heater

121 Heater box right side trailer

TOP VIEW OF ENGINE, TRANSMISSION, HEATER BOXES AND
FUEL TANK - Cont'd.

122 Refrigerant lines and trailer steering axle drag link

122) Drag link (trailer)

123) A/C suction line

124) A/C pressure line

125) Cover trailer modulating valve

123 Refrigerant suction and pressure line routing in tractor just before engine compartment

124 Air lines in tractor and rear axle suspension frame wishbone

125 Air reservoirs left side tractor and driver's heater lines

126 Air reservoirs right side of tractor and valves

126) Tractor front axle brake load proportioning valve

127) Pressure protection valve

128) Automatic moisture ejecting valve

129) Four circuit protection valve

130) Check valve one way

131) Supply air reservoir 143 psi

132) Accessory reservoir

133) Drive axle brakes

UNDER CARRIAGE VIEW OF AIR RESERVOIRS AND VALVES

127 Drive axle suspension frame wishbone and tractor jacking pads

134) Hinge angle brake switch

135) Pressure limiting valve

136) Wishbone

128 Tractor water modulating valve

137) Modulating valve

129 Blower motor speed control regulator

138) Pressure regulator

130 Heater box cage fan

UNDER CARRIAGE VIEW OF AIR RESERVOIRS AND VALVES - Cont'd.

- 131 Trailer air reservoir
 - 139) Trailer axle brake load proportioning valve
 - 140) Brake air reservoir
 - 141) Trailer suspension air reservoir
 - 142) Accessory air reservoir
- 132 Trailer heater box and marine pump
 - 143) Marine pump motor
 - 144) Bottom of heater box
 - 145) Heater box blower motor
- 133 Trailer water modulating valve
 - 146) Modulating valve
 - 147) Fuel tank
- 134 Trailer steering axle reversing lever
 - 148) Reversing lever
- 135 Heater box with all lines connected
 - 149) Heater lines supply and return
 - 150) A/C refrigerant lines suction and pressure
- 136 Turntable area
 - 151) Cable with turn buckle for securing bellows to coach and trailer
- 137 Supply air reservoir
 - 152) Manual drain valve
- 138 Structure in fuel tank area
- 139 Air compressor unloader valve
 - 153) Muffler location
 - 154) Unloader valve, 143 psi
- 140 Enlarged view hinge angle brake switch incorporating stoplight switch
 - 155) Stoplight switch

UNDER CARRIAGE VIEW OF AIR RSERVOIRS & VALVES - Cont'd.

141 Brake valves at rear axle

156) Quick release relay valve right side
157) Quick release relay valve left side
158) Trailer brake control valve
159) Drive axle brake load proportioning valve

142 Tractor right side air reservoir front view

160) Reusable air filter in housing
161) Pressure charging valve (adjustable)

143 Tractor right side air reservoirs rear view

TURNTABLE AREA

144 Attaching table to trailer

145 Horizontal hinge angle switches installed

146 Attaching table to tractor

147 Top view with linkage

162) Rod assembly locating
163) Arm locating

148 Turntable top view hinge angle switches installed

164) Warning and brake application ramps
165) Warning switch
166) Brake application switch
167) Ball joint assembly carrier

149 Turntable top view trailer to tractor

150 Electrical junction box for electrical connections

168) Junction box

151 Left side view of engine

169) Battery box
170) Voltage regulator compartment

152 Radiator with air baffles attached to shroud

UNDER CARRIAGE VIEW ENGINE, EXHAUST SYSTEM AND
TRANSMISSION

153 Enlarged view left front engine
171) Alternator
172) 105° temperature switch

154 Rear view transmission bottom
173) Right angle speedometer cable drive
174) Transmission oil heat exchanger
175) Transmission

155 Enlarged view bottom right side of engine
176) Oil pressure gauge switch
177) Starter protection oil switch
178) Engine turbo charger
179) Engine oil heater exchanger
180) Engine starting motor

156 Engine exhaust muffler
181) Muffler
182) Tailpipe

157 Left side view transmission
183) Air compressor unloader valve muffler

158 Flex exhaust pipe right side of engine
184) Service brake stoplight switch

159 Engine turbo charger rear view
185) Engine cold start plugs

160 Enlarged view engine oil heat exchanger, starter, oil protection switch and oil pressure gauge switch

161 Switches in coolant pipe right front side of engine
186) Coolant temperature gauge switch
187) Radiator coolant fan control switch
188) Coolant overheat warning switch
189) Engine thermostat
190) Engine compartment light
191) Engine oil filter

PHOTO
NUMBER

UNDER CARRIAGE VIEW ENGINE, EXHAUST SYSTEM
AND TRANSMISSION - Cont'd.

162 Left front and side view of engine
163 Articulation bellows laced

INTERIOR VIEWS COMPLETED COACH

164 Recirculated air inlet right side trailer
192) Grad-u-stat
165 Turntable front to rear
166 Turntable rear to front
167 Ceiling P.A. speakers
168 Seating rear to front
169 Rear route sign in trailer
193) Sign curtain control motor
194) Switch for sign motor
170 Seating front to rear
171 Settee seat trailer
172 Settee seat raised for A/C unit access
173 Enlarged view emergency escape hatch in roof
174 Emergency escape hatch open
175 Five position roof ventilating hatch closed
176 Ventilating hatch in one of open positions
177 Shock cover and air suspension nut removal in heat duct
195) Suspension nut under cover
196) Shock bracket cover
178 Left rear suspension nut access cover in heat duct installed

INTERIOR VIEWS COMPLETED COACH - Cont'd.

179 Right rear suspension nut access cover installed

180 Seat installation in turntable area

181 Cross seat pedestals left side front to rear

182 Seat mounting on wheelhousing

183 Enlarged view seat mounting on wall track

184 Number one cross seat tractor right side rear view

185 Number one cross seat tractor right side front view

186 Seat mounted on water box which covers surge tank and power steering oil reservoir

187 Right front of coach interior with rear view mirror front stepwell convex mirror and mirror to view exit door stepwell mirror

188 Drivers rear view mirror, front destination sign door closed, with stop request sign, and air vents open

189 Front destination sign door open

197) Curtain sign motor

190 Left side view front destination sign door open

198) Voice page speaker

191 Right side front destination sign door open

199) Door master switch

192 Side destination sign

200) Passenger chime signal switch

193 Right side entrance door operating equipment compartment

194 Entrance compartment door open

201) Stepwell and curb light

202) Mag door control valve

203) Stepwell and curb lights

204) Door operating cylinder

205) Emergency door opening air release valve

INTERIOR VIEWS COMPLETED COACH - Cont'd.

195 Exit door stepwell mirror
206) Passenger chime

196 Exit door cam switch one for each door leaf
207) Cam switch

197 Exit door operating equipment compartment door closed
208) Passenger signal light indicating doors unlocked

198 Exit door switch identification
209) Forward door operating cylinder
210) Sensitive edge pressure switch
211) Sensitive edge switch
212) Stepwell and curb light switch
213) Mag valve
214) Stepwell and curb light switch
215) Aft door operating cylinder
216) By-pass relay
217) Door opening hold relay
218) Touch bar relay
219) Sensitive edge alarm relay
220) Alarm cut-out relay
221) Sensitive edge relay
222) Door fully open relay
223) Door fully open relay
224) Emergency door opening release valve

199 Rear stepwell

200 Exit door forward barrier

201 Entrance door stepwell

202 Entrance door stepwell and farebox mounting area

203 Entrance door stepwell, driver's heater control and route number sign assembly

204 Enlarged view of route number sign assembly

205 Enlarged view route number sign in position to set

206 Driver's ceiling area with driver's light

207 Enlarged view driver's heater control levers

INTERIOR VIEWS COMPLETED COACH - Cont'd.

208 Enlarged view of brake and accelerator pedals
225) Park brake emergency release valve

209 Enlarged view of driver's console
226) Silent alarm switch
227) Entrance door dump air valve
228) Fire extinguisher bracket
229) Exit door sensitive edge alarm buzzer
230) Turn indicator switch

210 Fire extinguisher installed

211 Top view of driver's console
231) Engine emergency shutdown switch
232) A/C engine start switch
233) Driver's ceiling light switch
234) Interior light switch
235) Passenger stop signal switch
236) Engine fast idle switch
237) Exit door open by-pass switch
238) Entrance and exit door leaf control switch
239) Auxiliary heater indicator light
240) Warning buzzer for engine oil pressure, low air pressure, engine overheat and hinge angle
241) Park brake release valve
242) Driver's adjustable air flow ball
243) Entrance and exit door control valve

212 Partial view instrument panel

213 Full view driver's area including headlight dimmer switch and speedometer cable
244) Adjustable air flow heat duct
245) Head lamp dimmer switch
246) Speedometer cable

214 Enlarged view instrument panel

215 Top view park brake emergency release valve location

216 Radio box closed

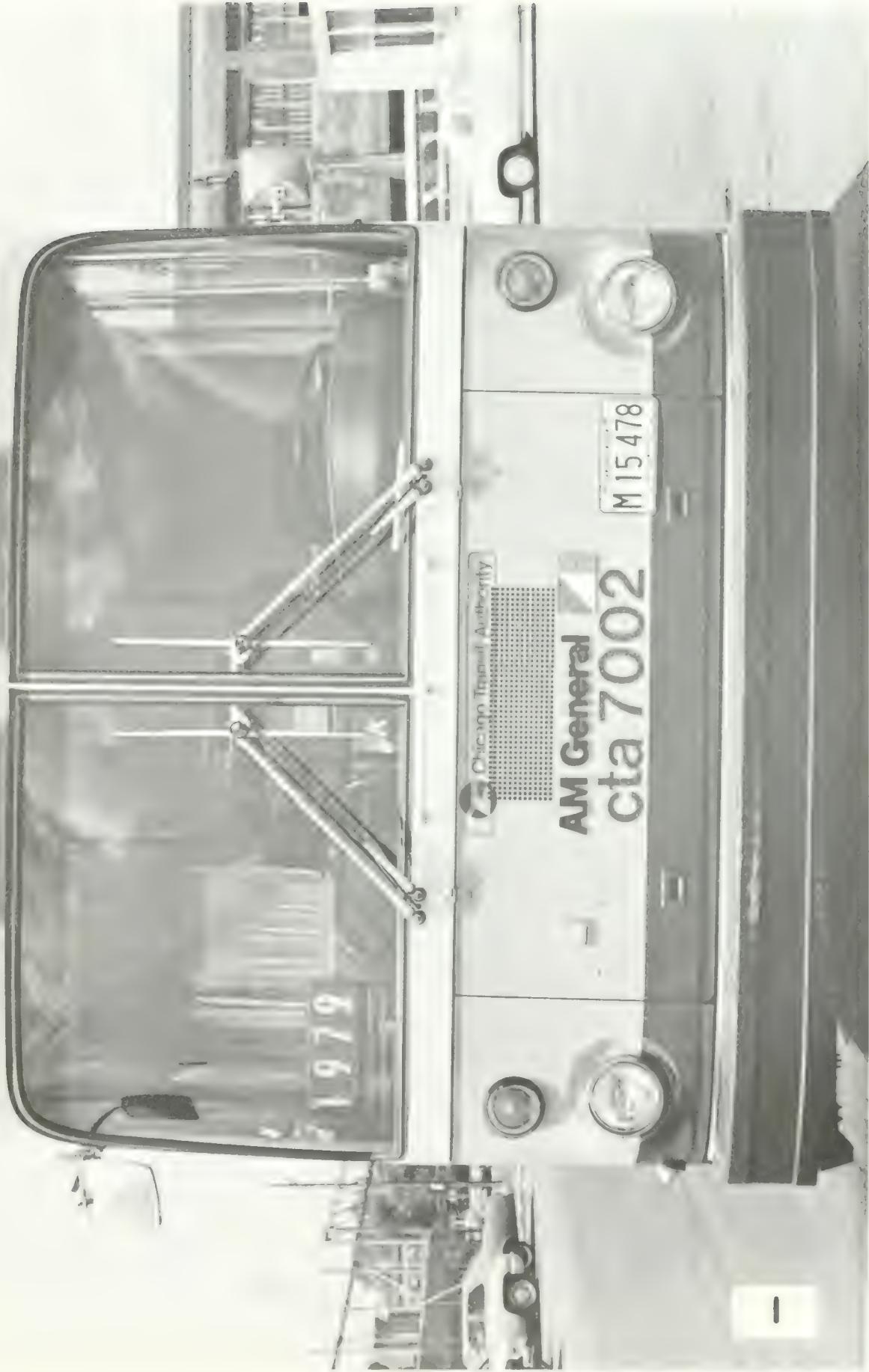
217 Radio box open with radio equipment installed

218 Radio head behind and above driver left side

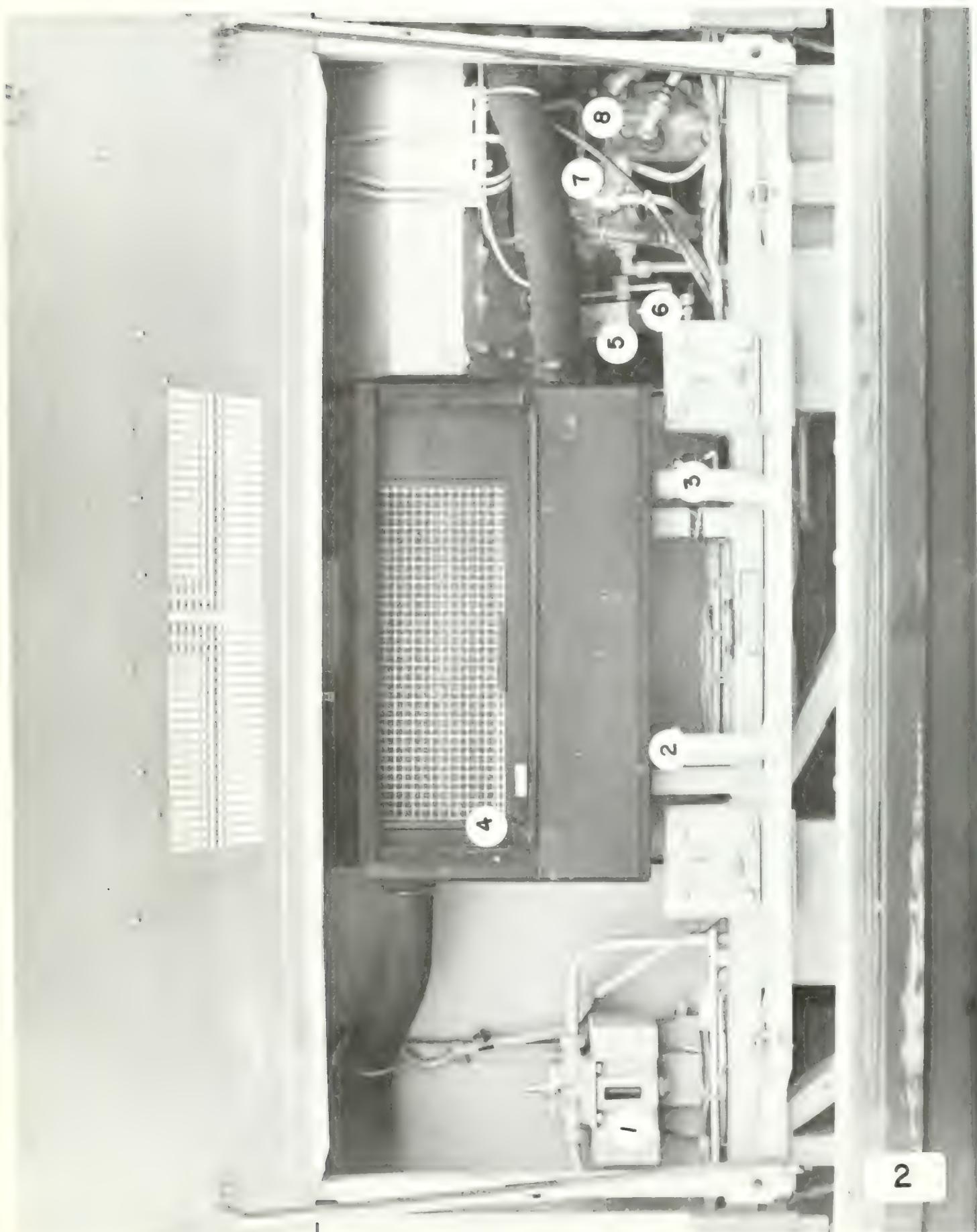
INTERIOR VIEWS COMPLETED COACH - Cont'd.

- 219 Trailer left side recirculated air inlet
- 220 Louvered HVAC air outlet left side trailer
- 221 Turntable seat left side with coach in left turn condition
- 222 Bellows top and side views right side of coach in left turn condition
- 223 Back of driver's barrier
- 224 Emergency opening instructions for side sash
- 225 Emergency opening lock handle in open position
- 226 Driver's air blower installation location behind driver's barrier in heat duct
- 227 Driver's air blower assembly location with duct in place

South Terminal





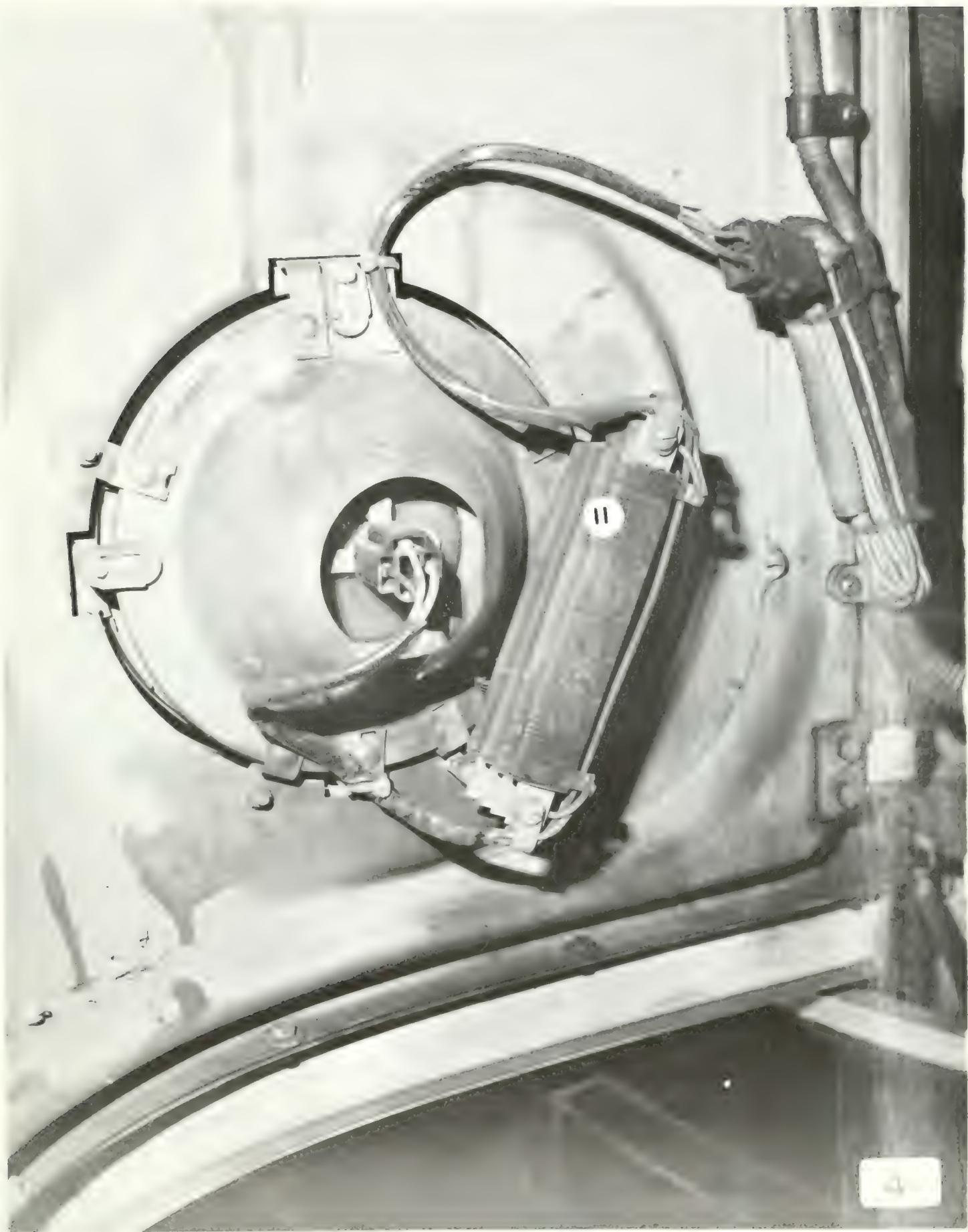




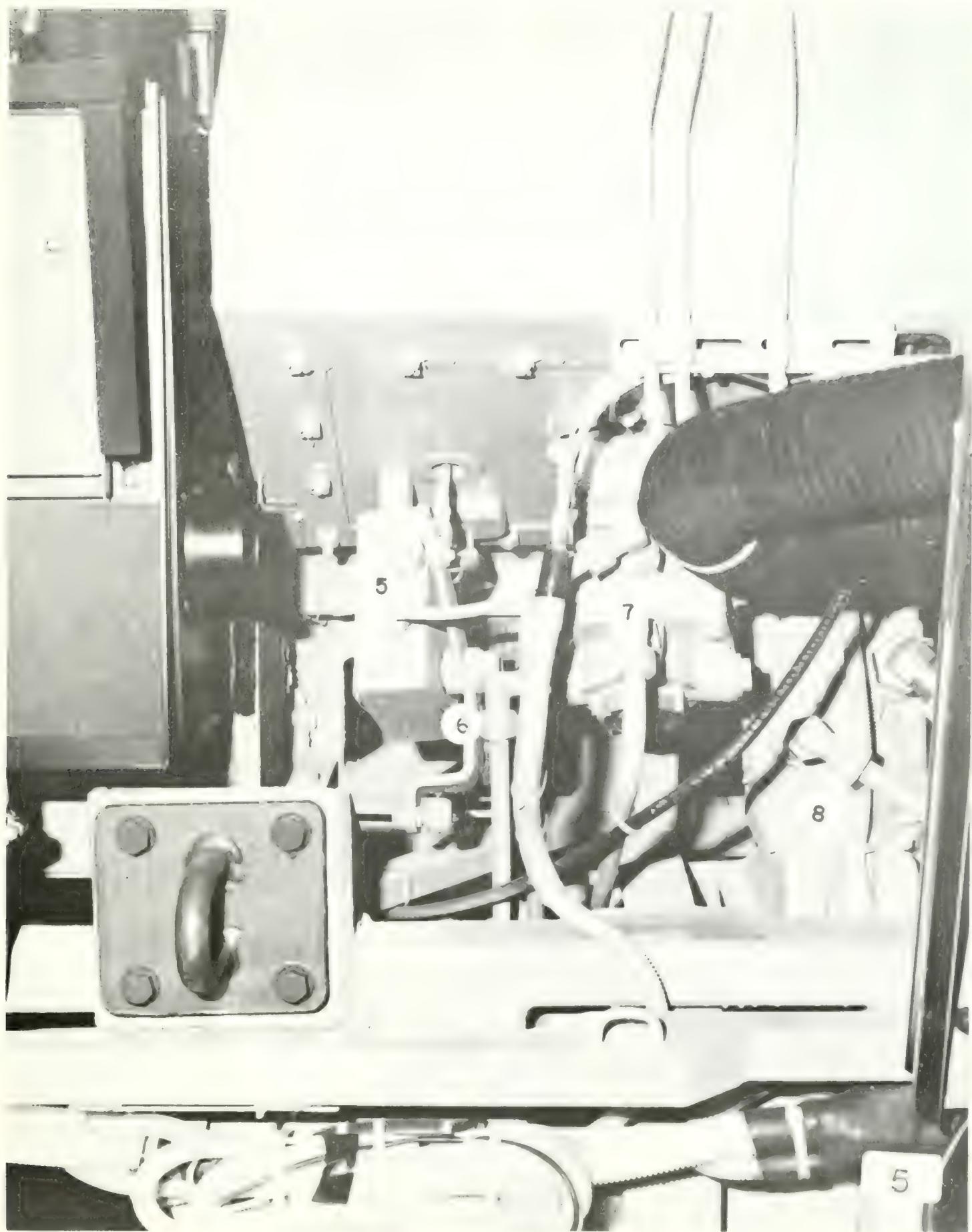


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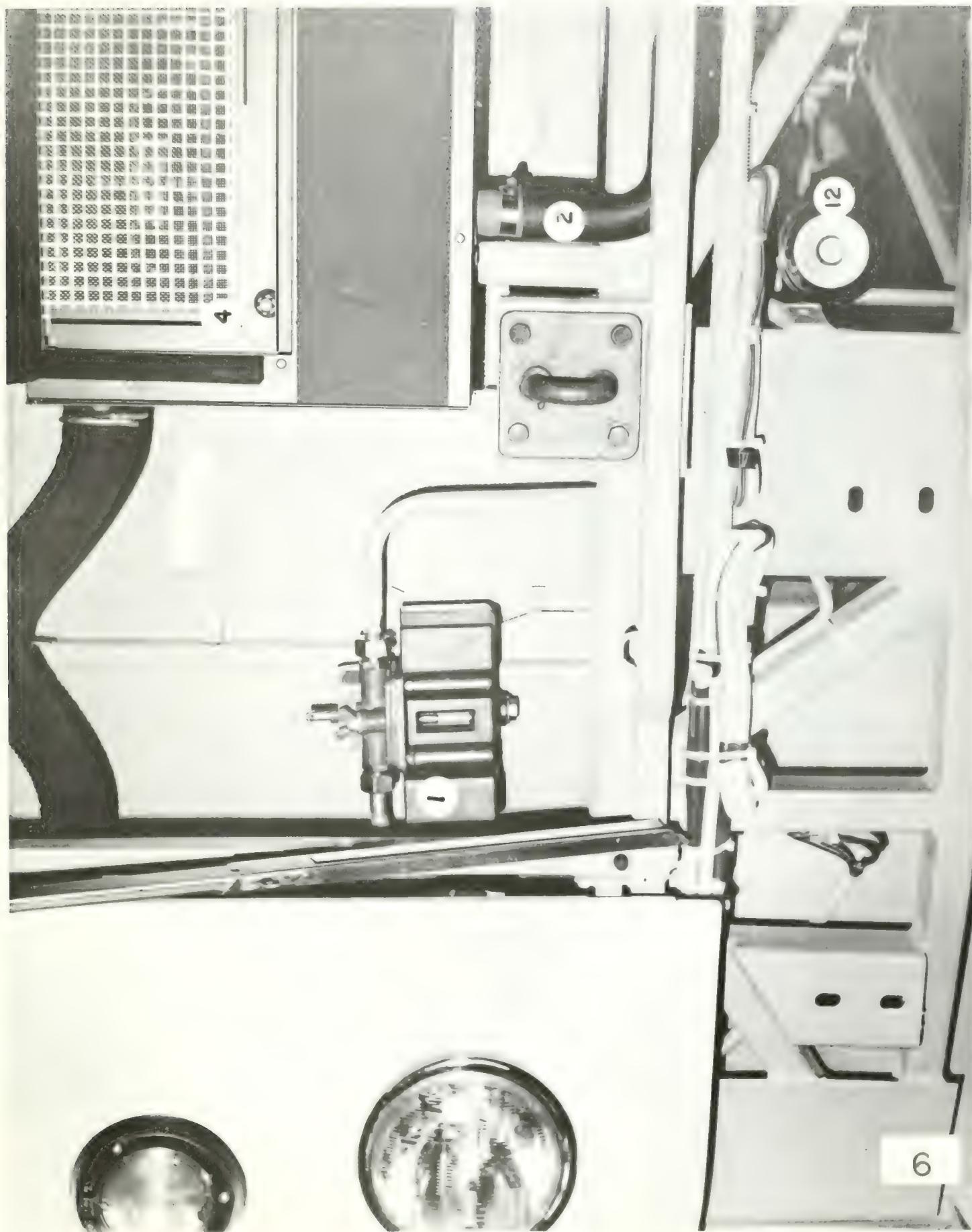














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RTA (Regional Transportation Authority)

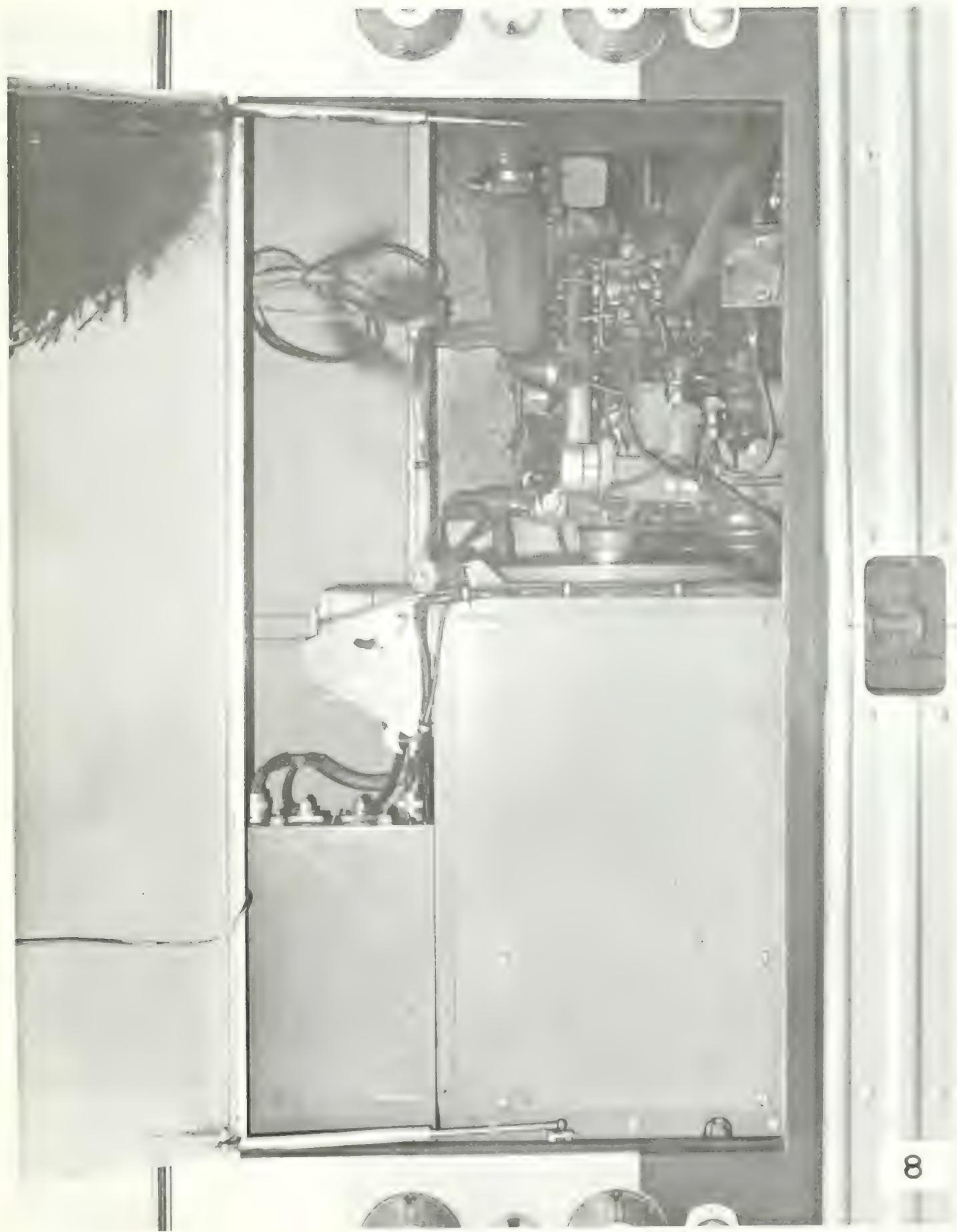
Every Sunday and Holiday

RTACTA Culture buses

Three routes from Art Institute

M 15 478

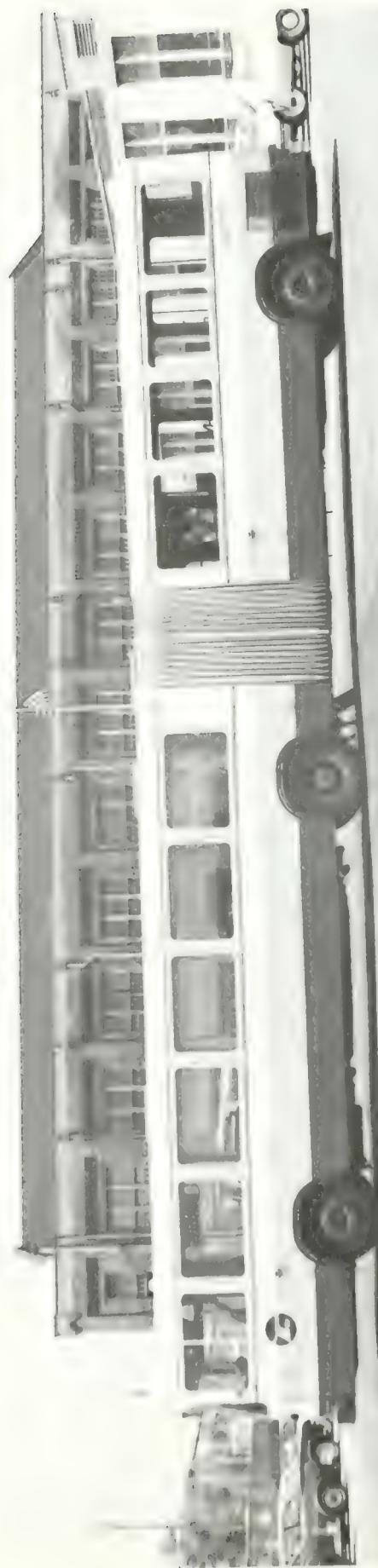




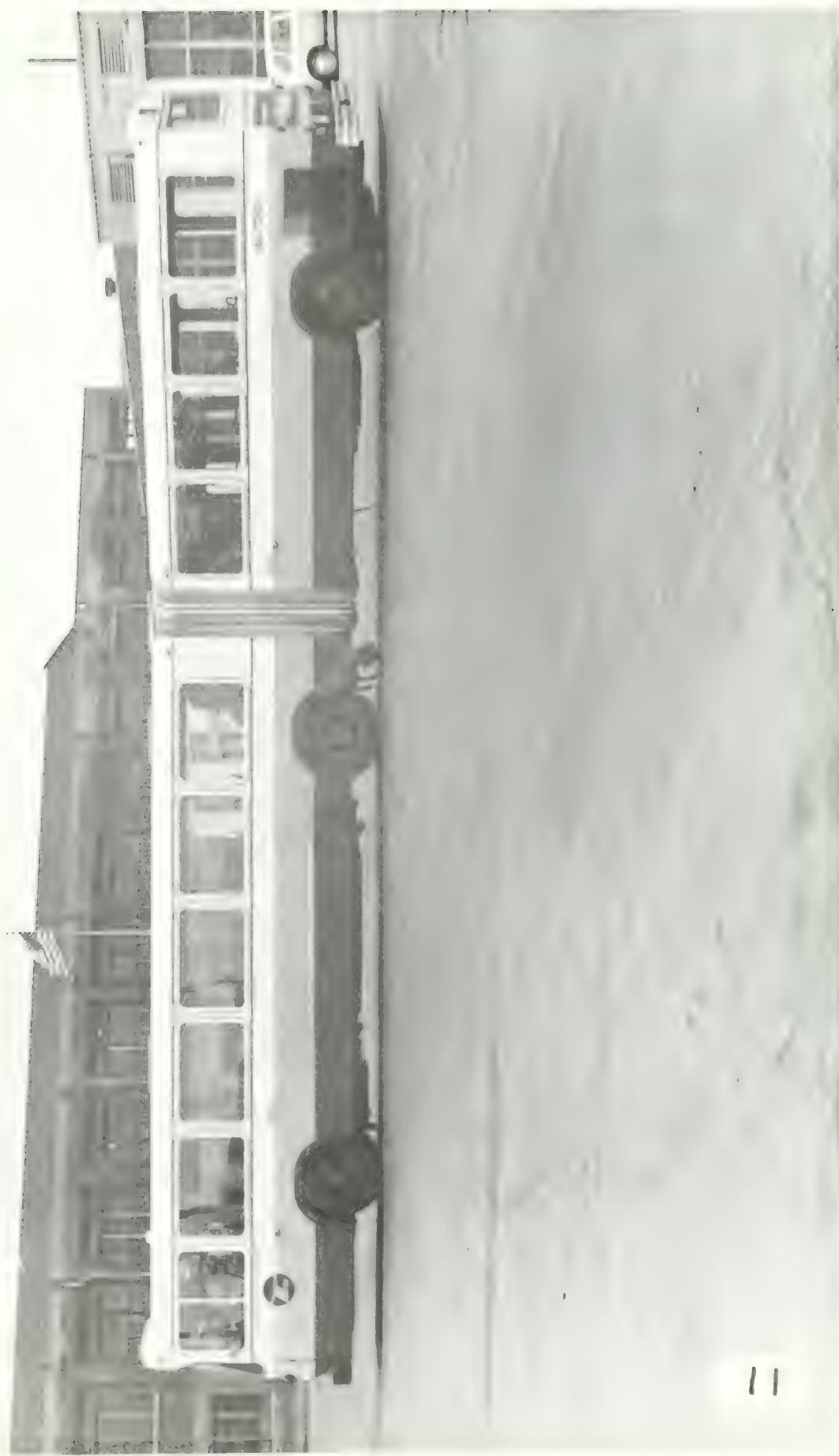








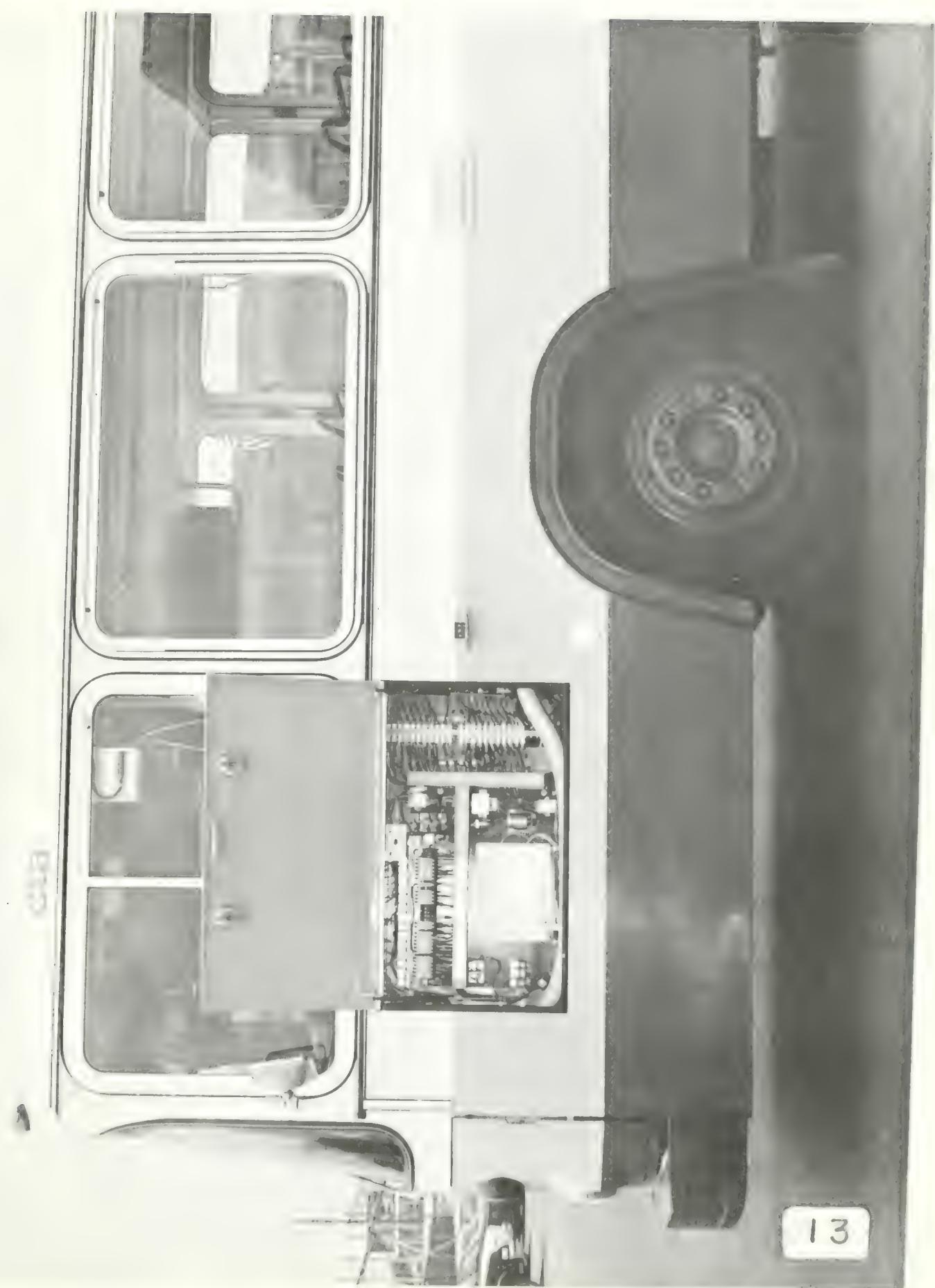




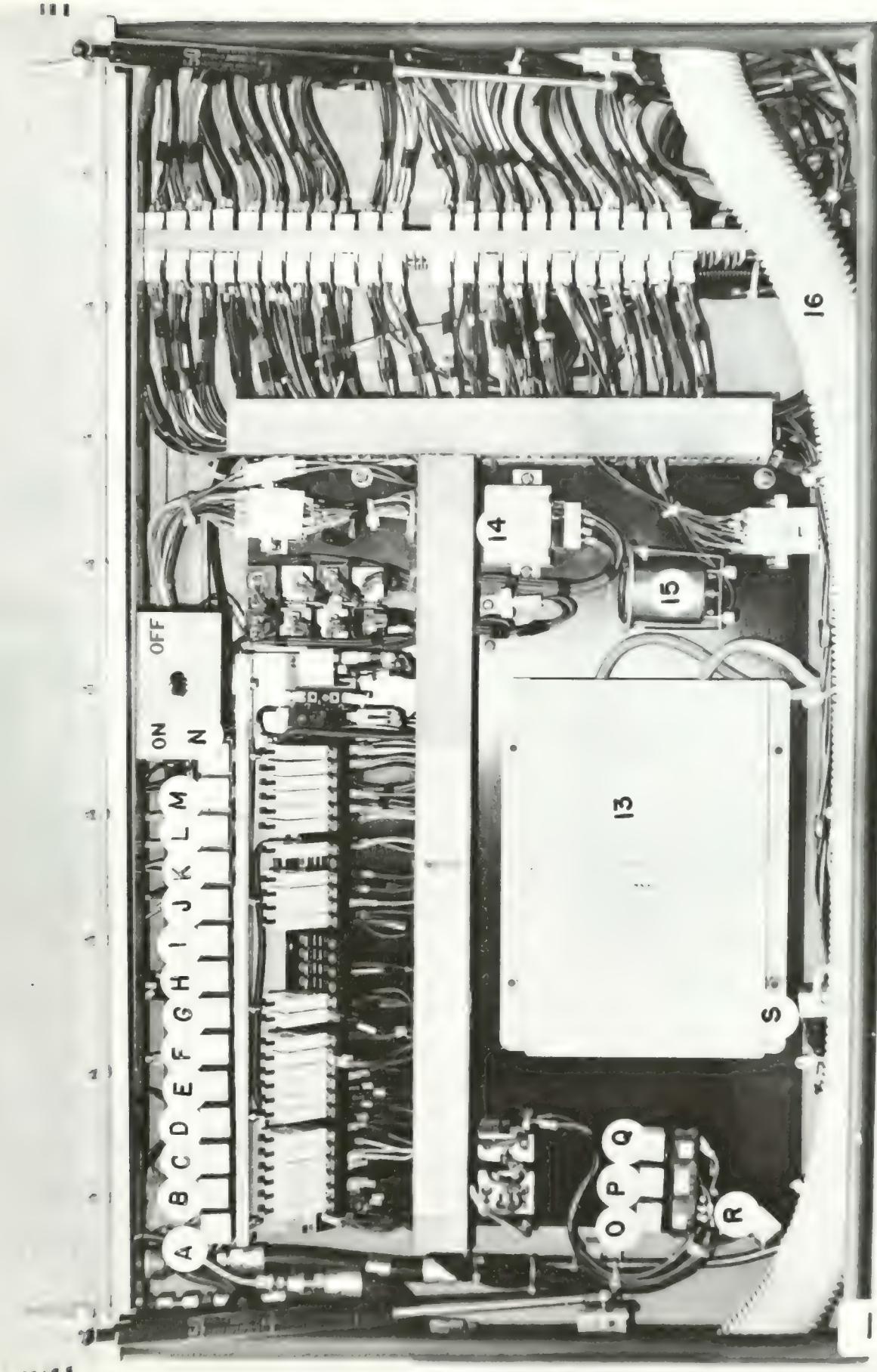




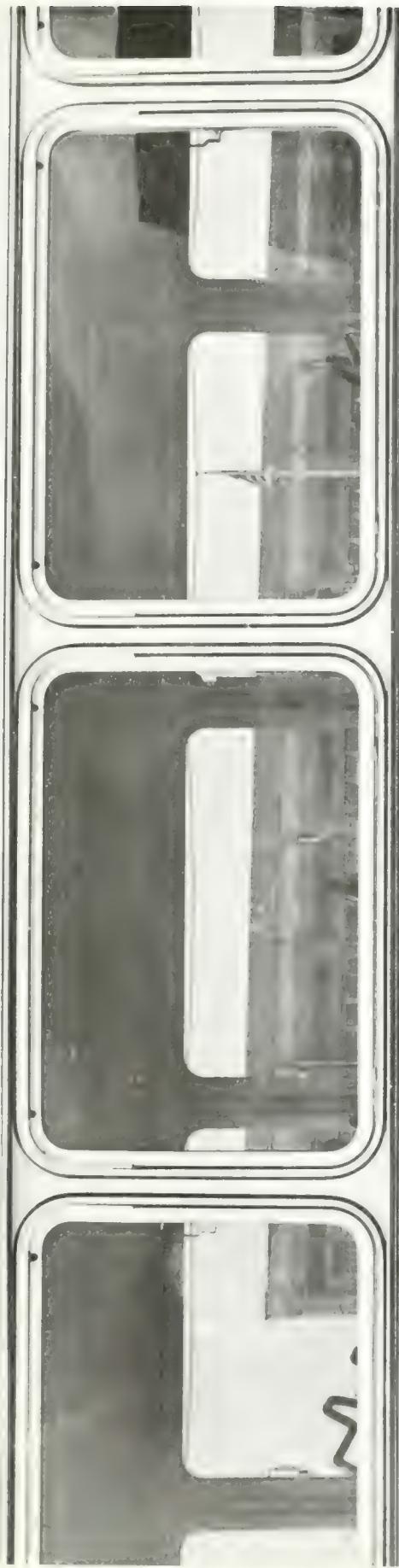




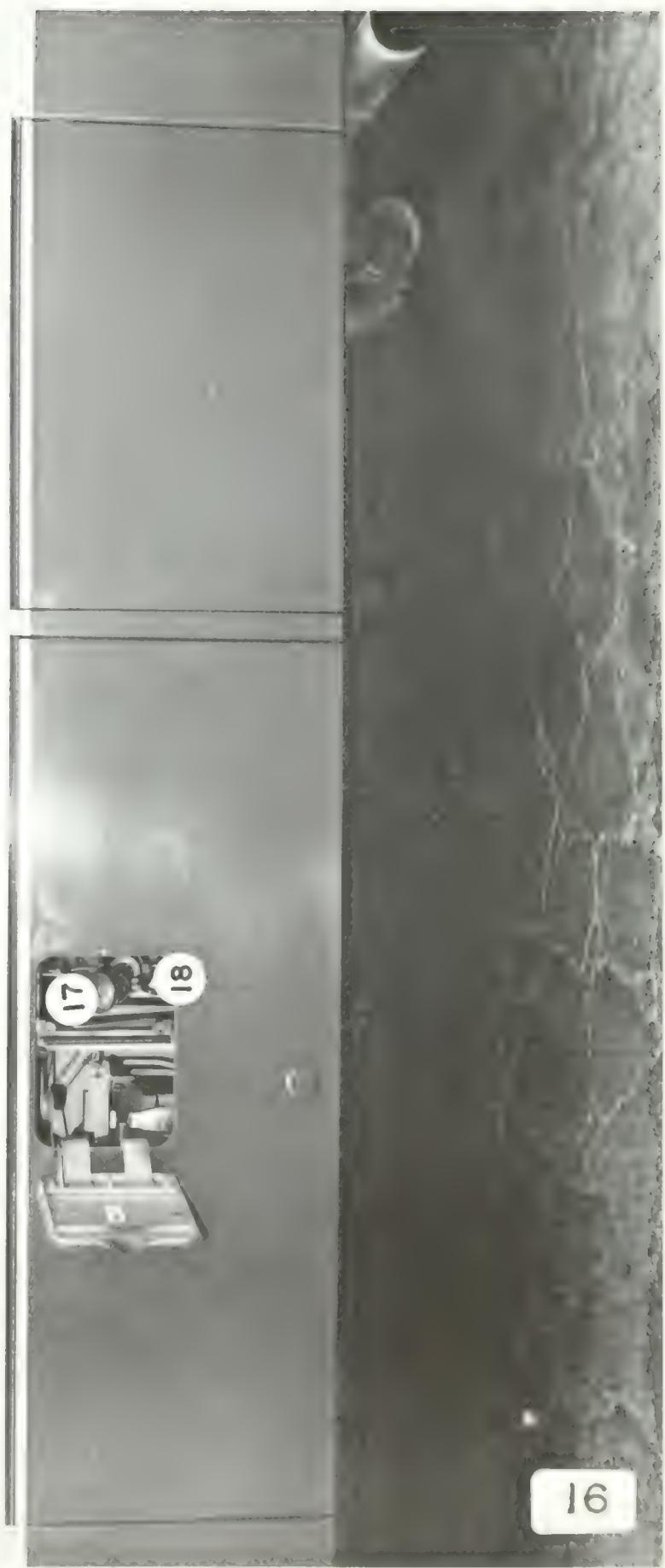




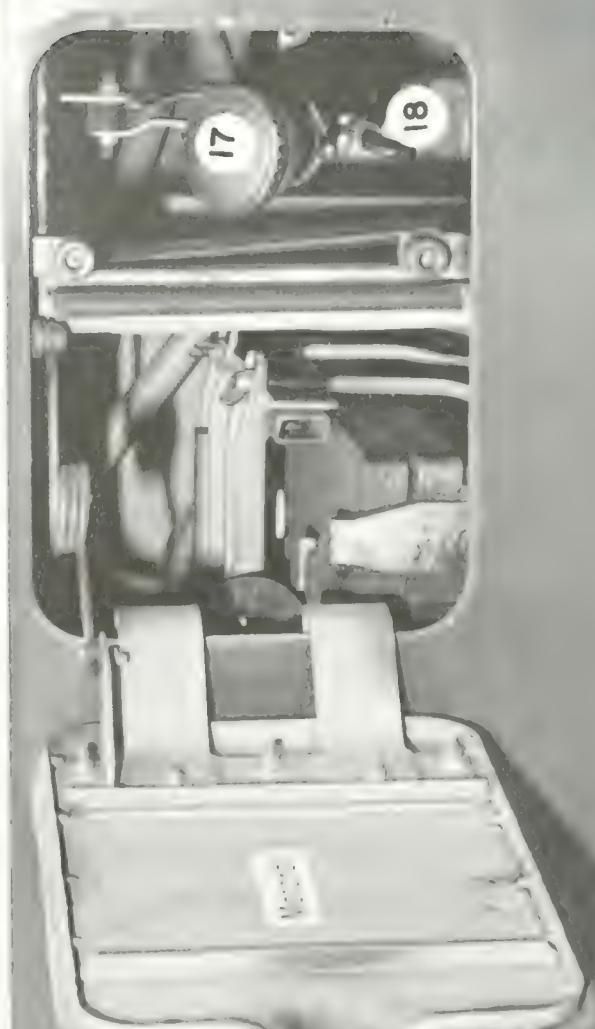






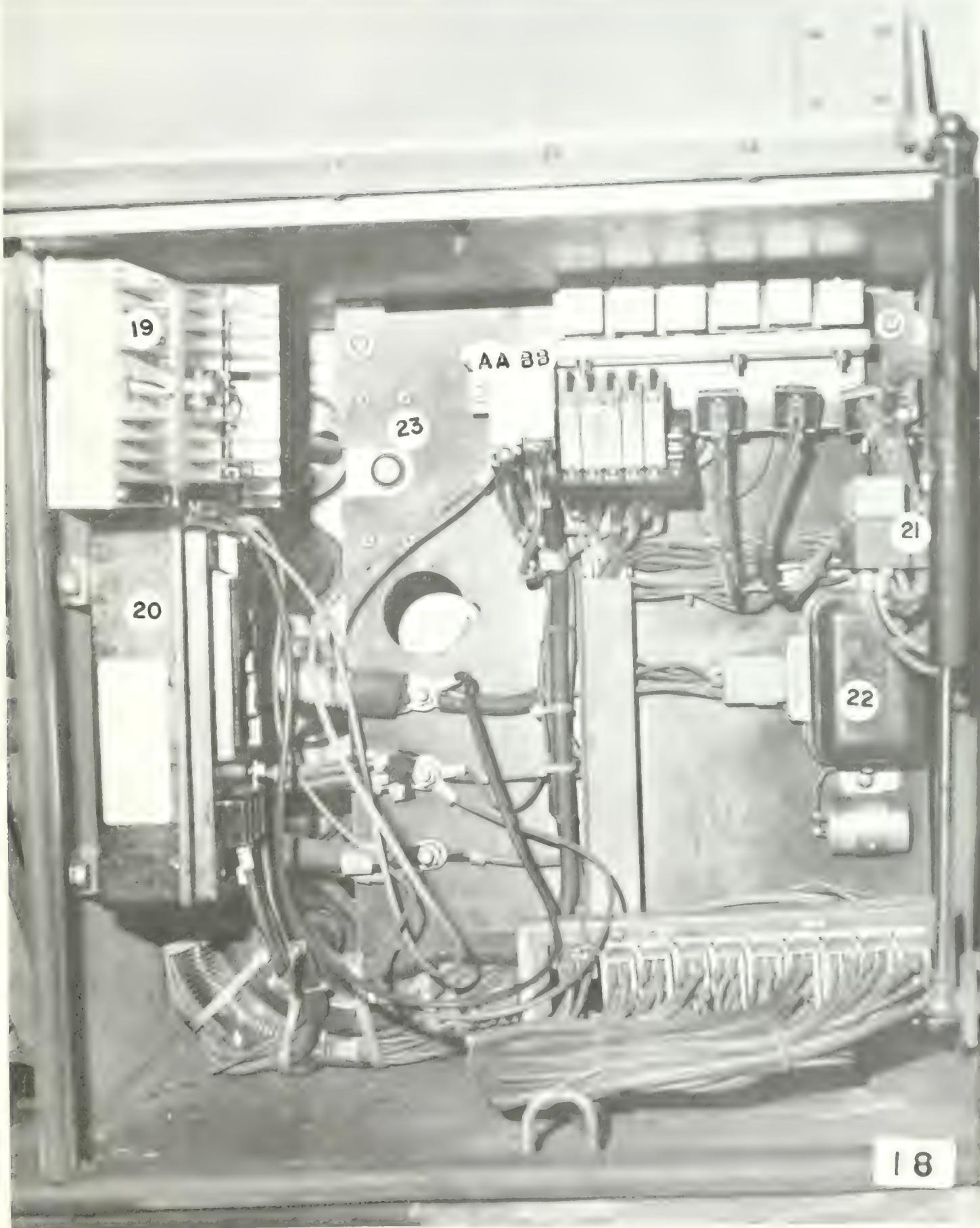




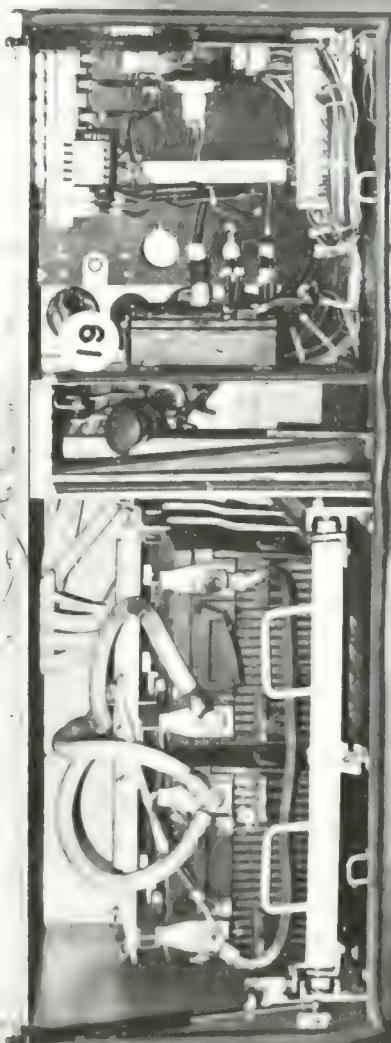
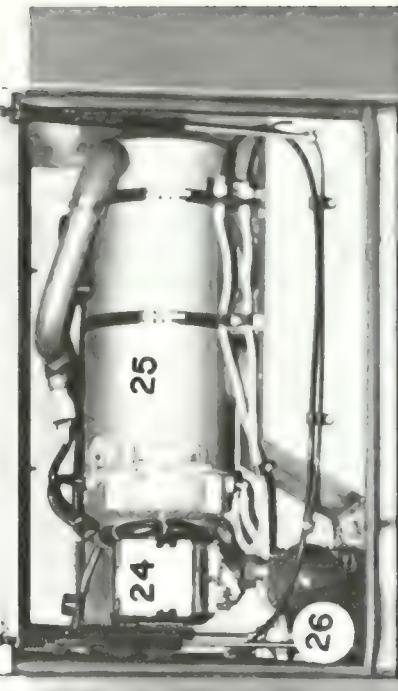


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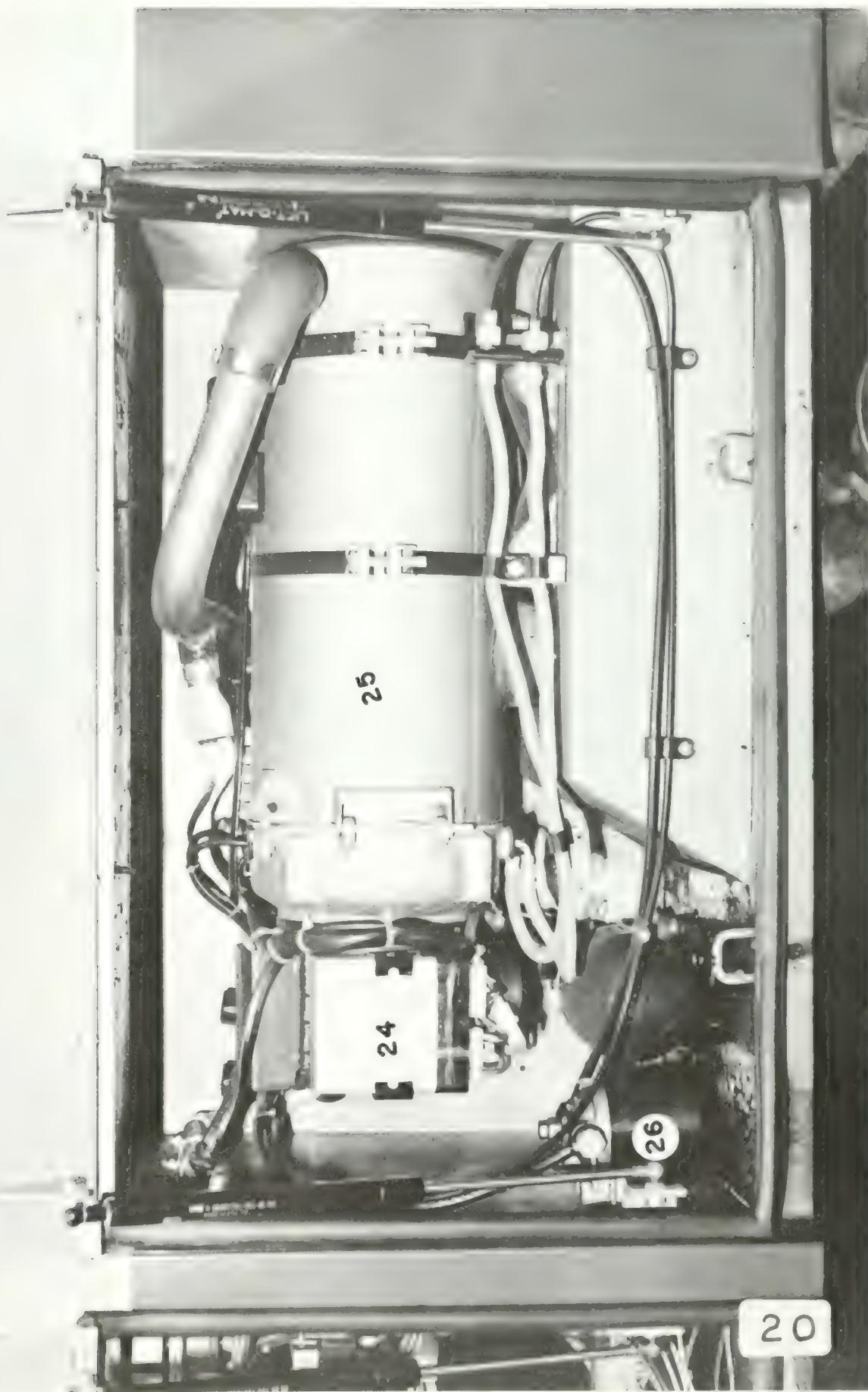




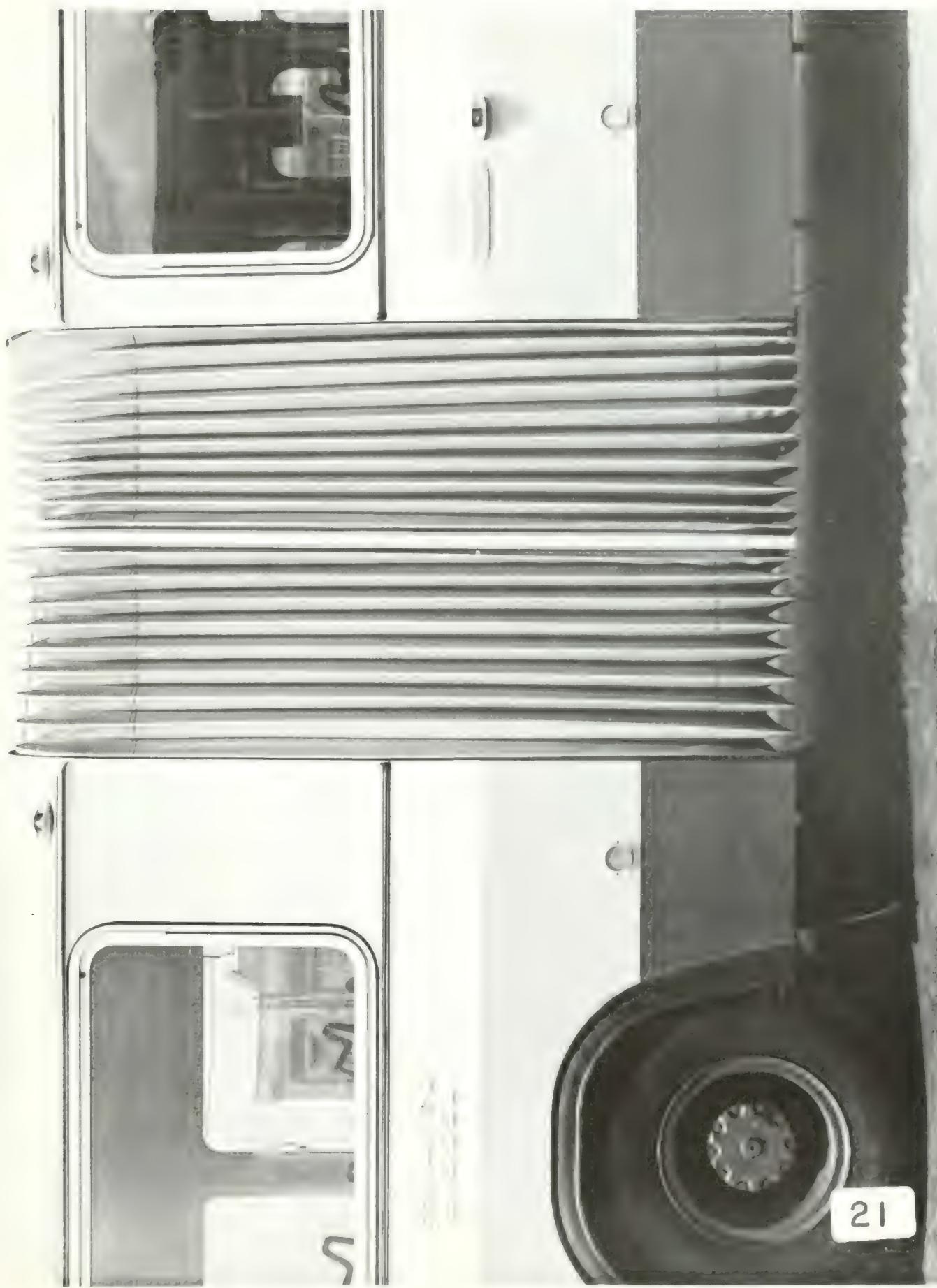








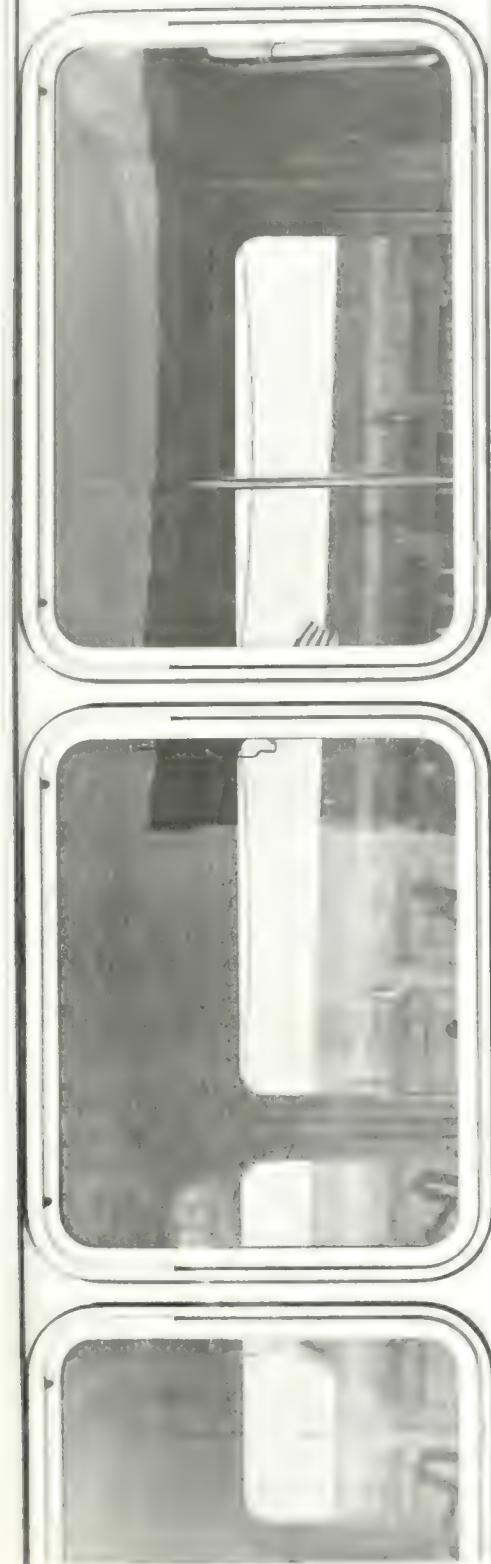




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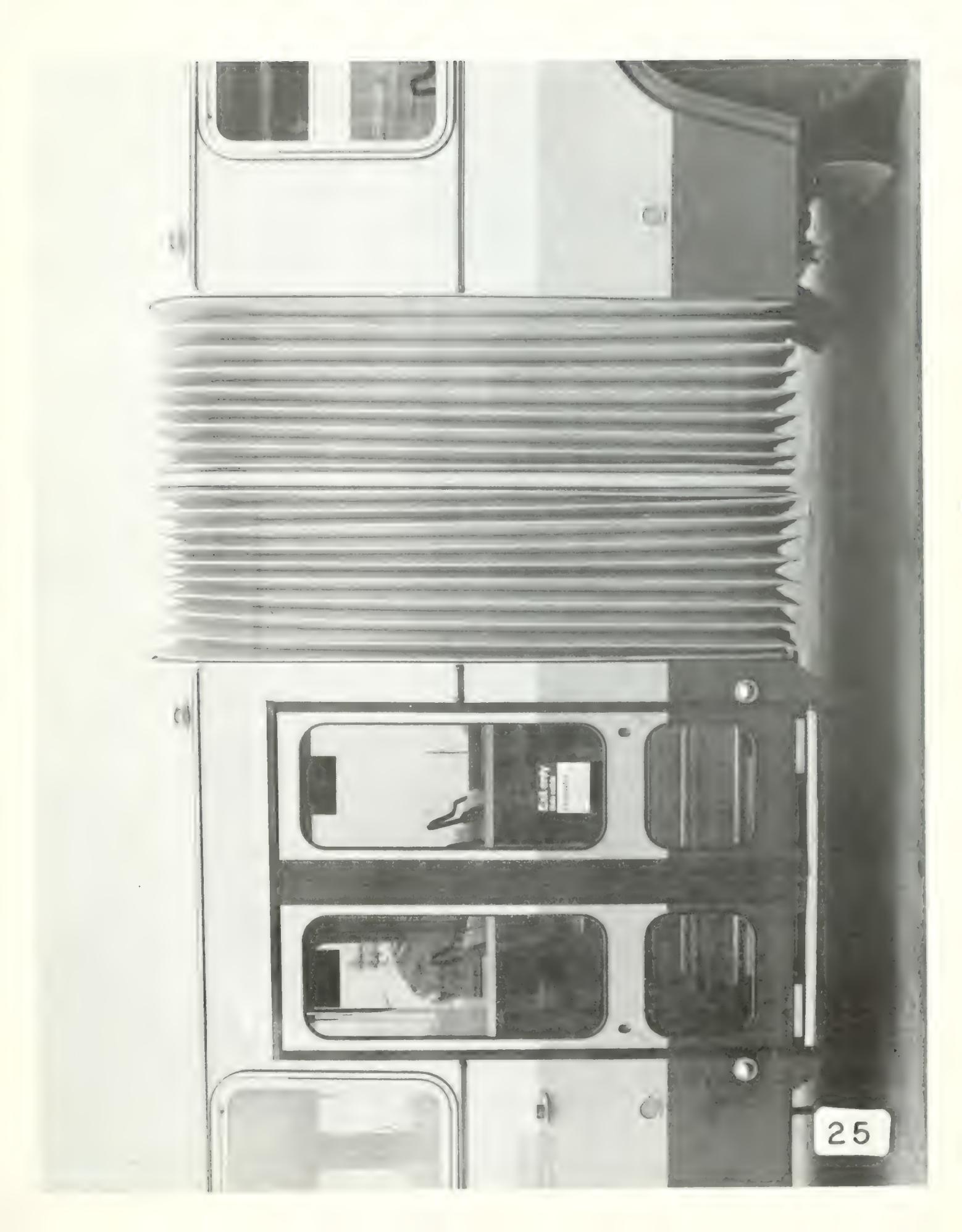












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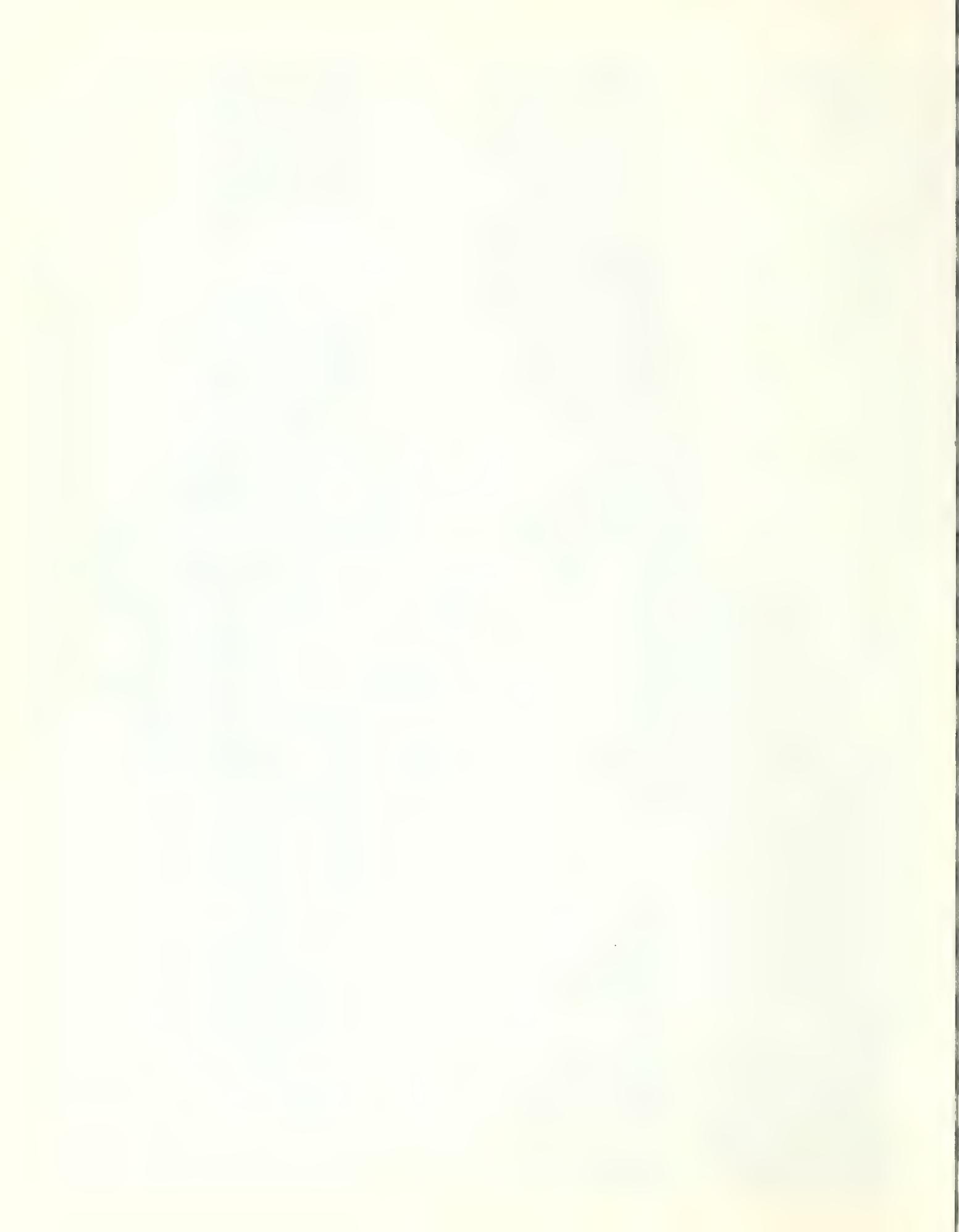






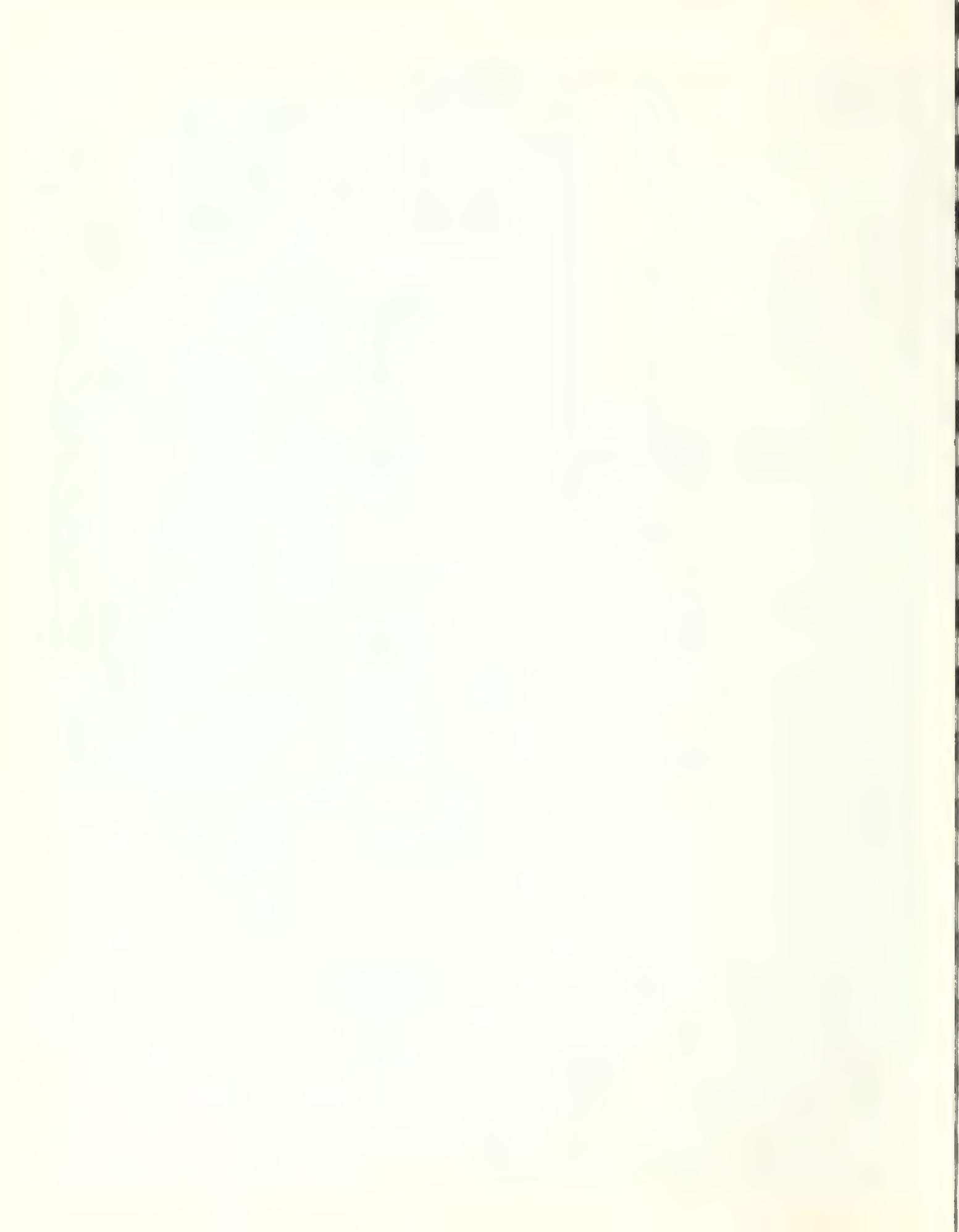


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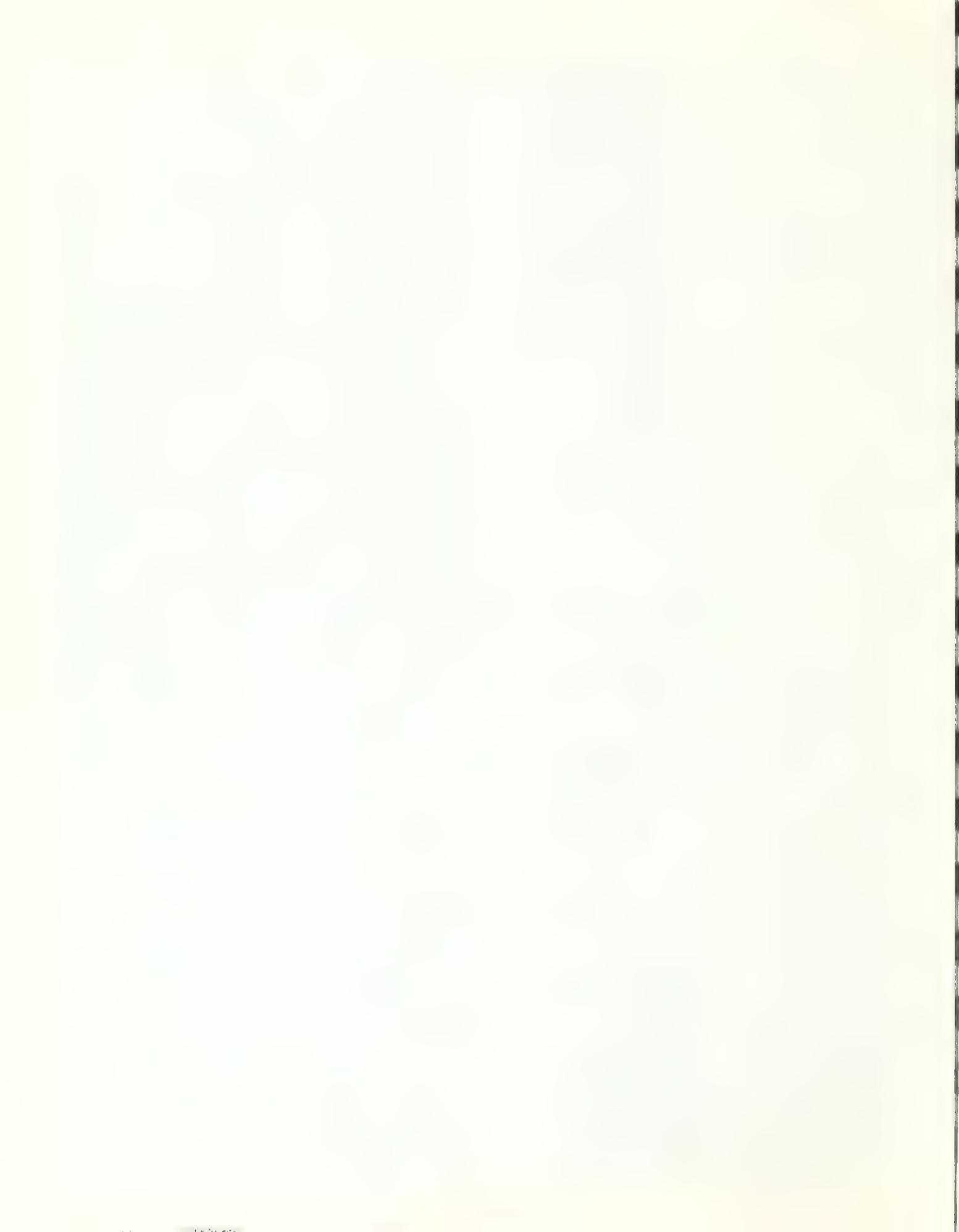


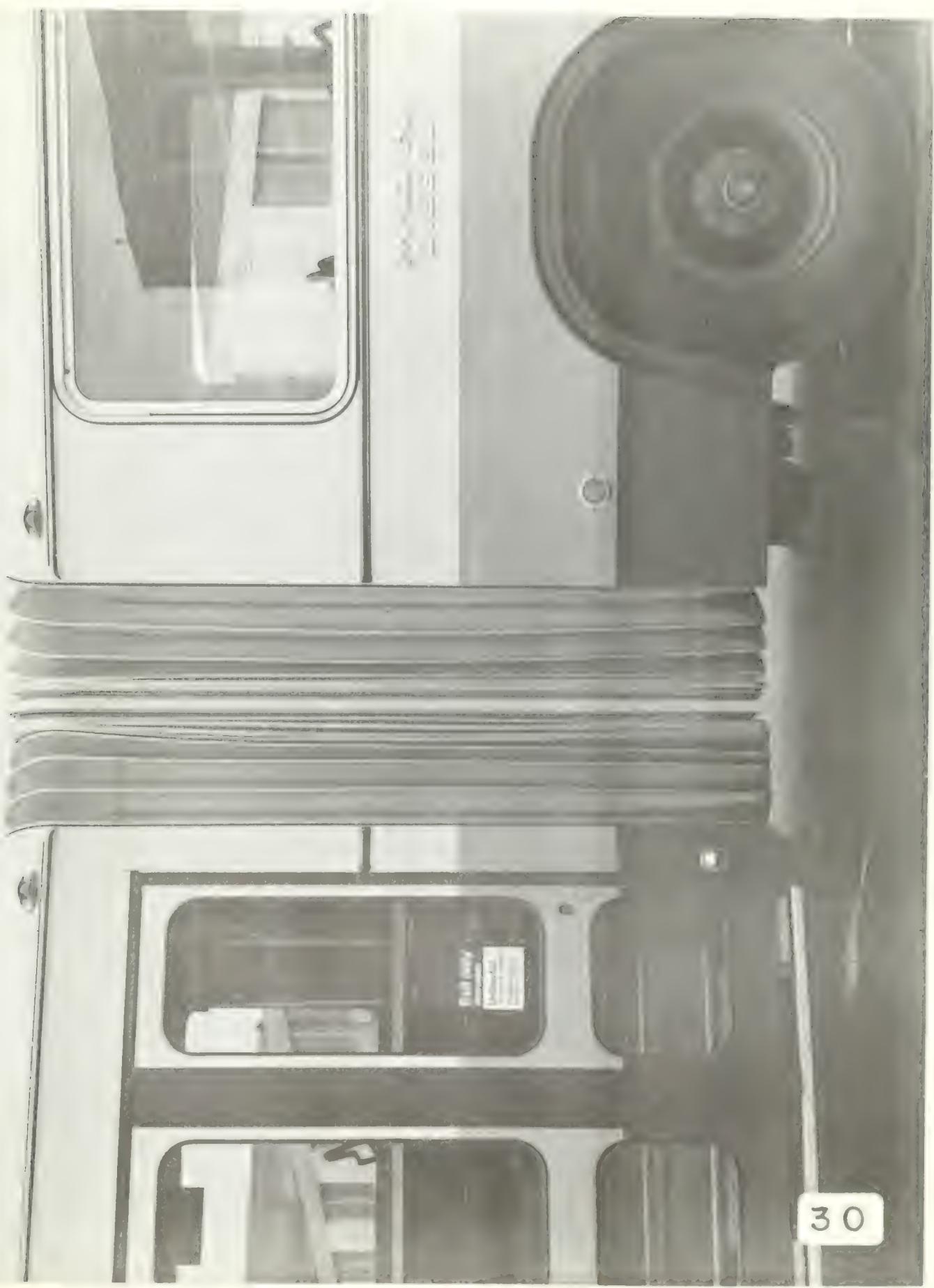
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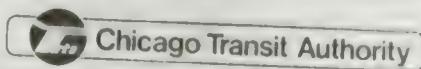




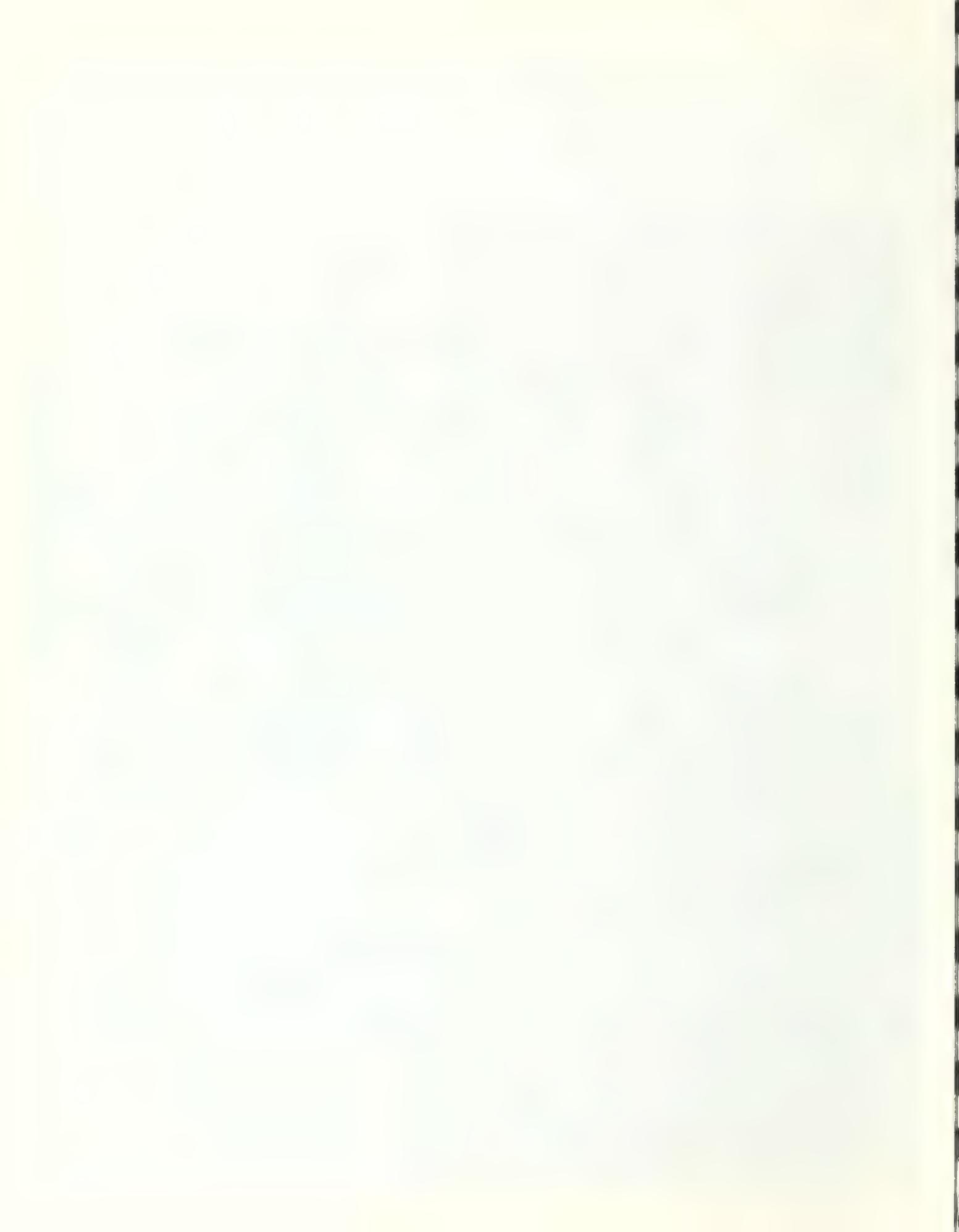
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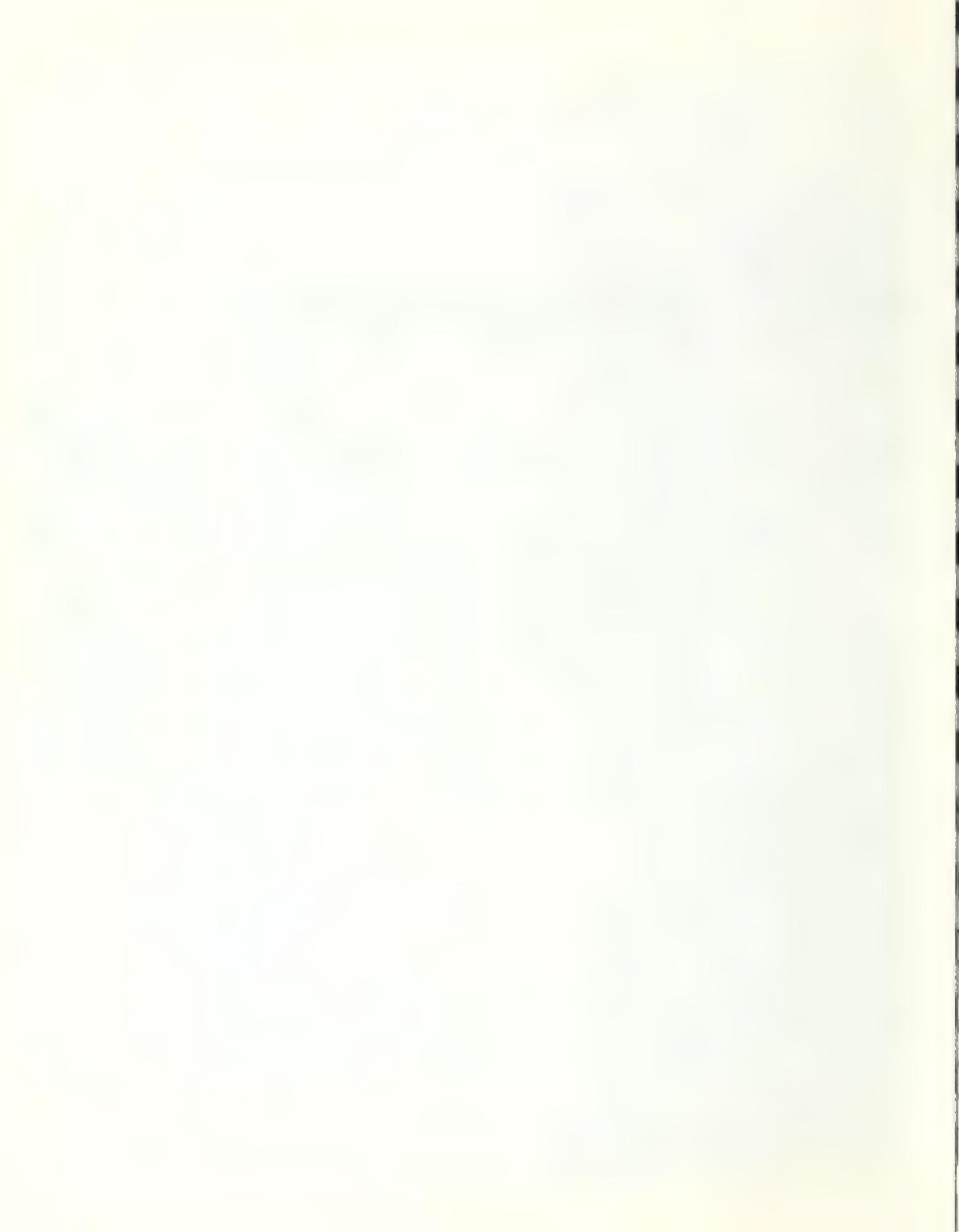
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required
Driver has
NO change

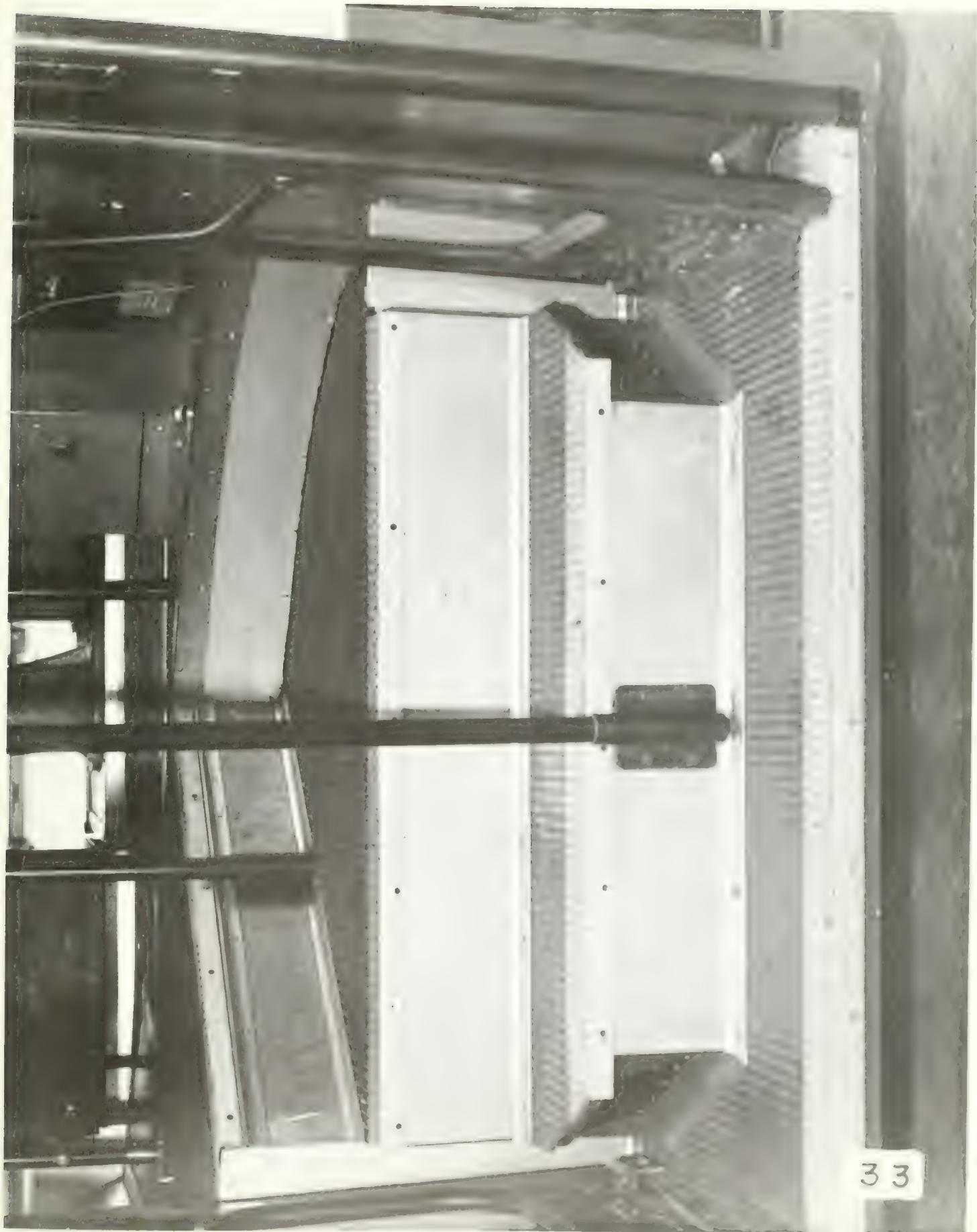




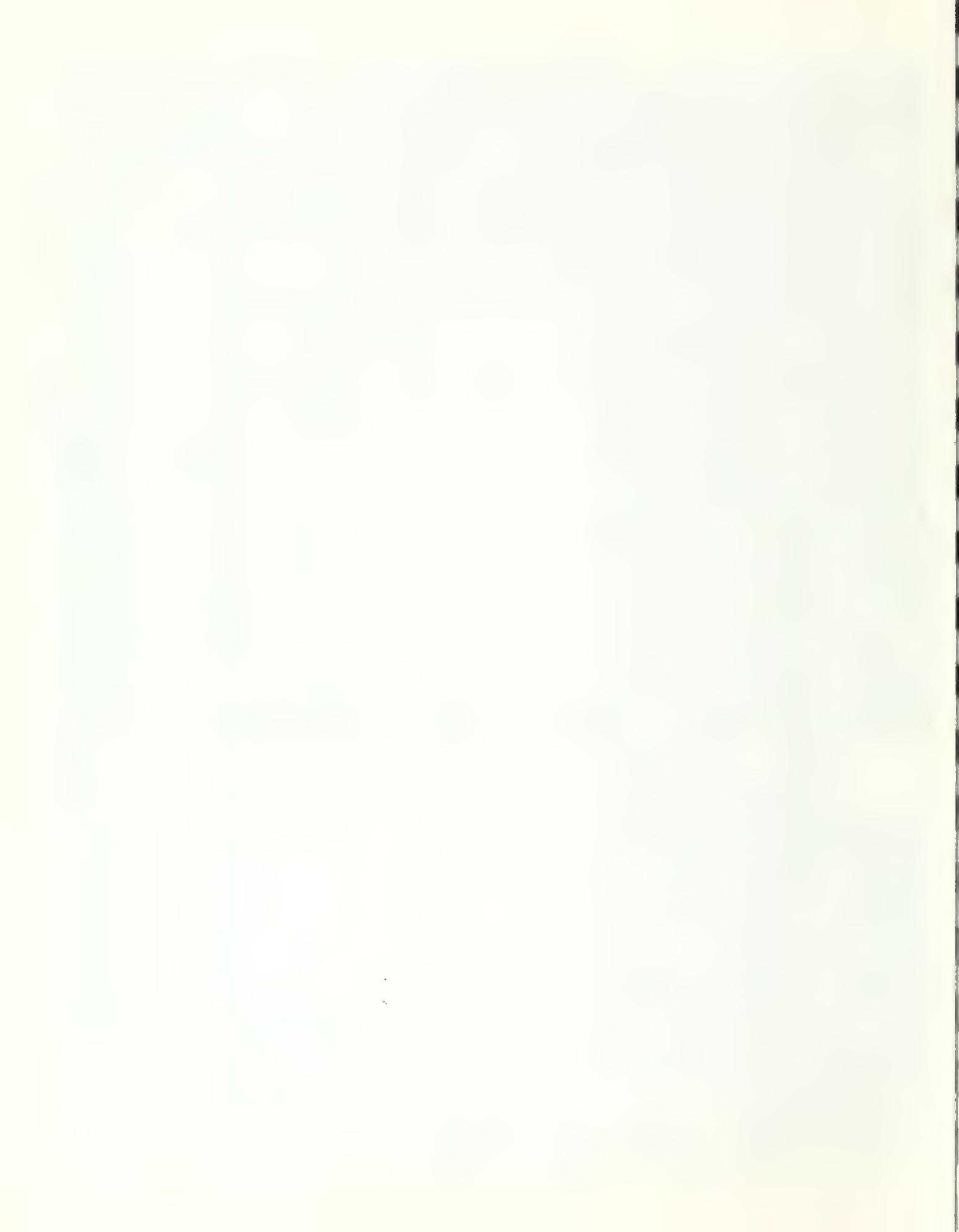
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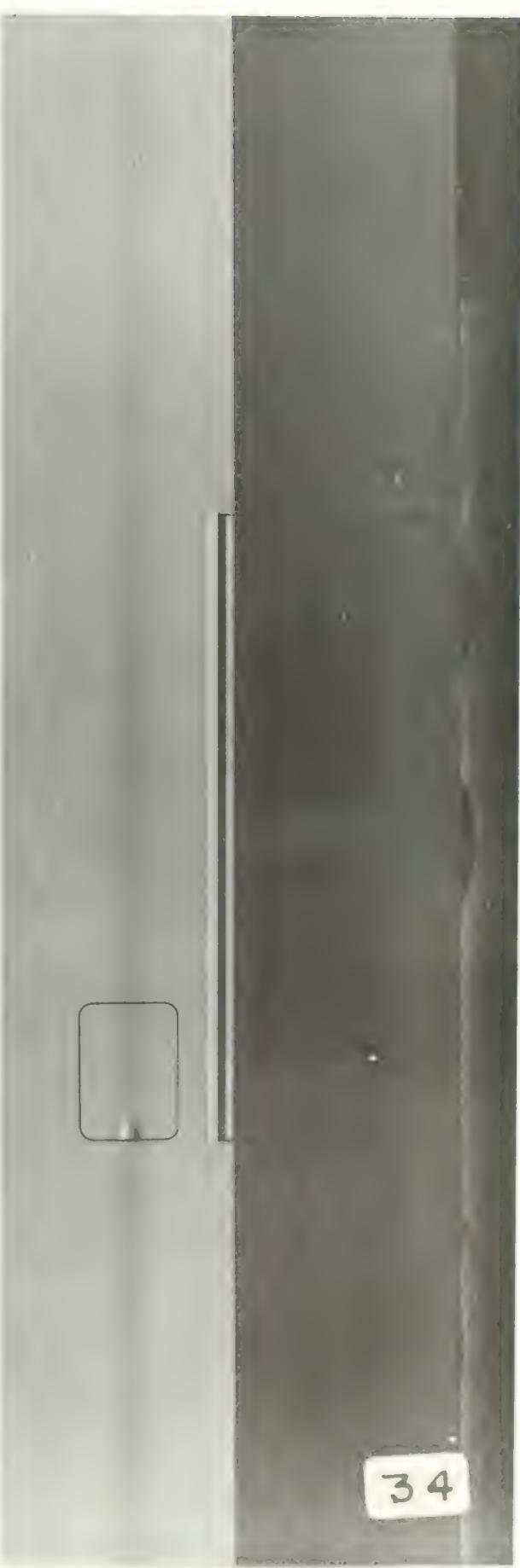
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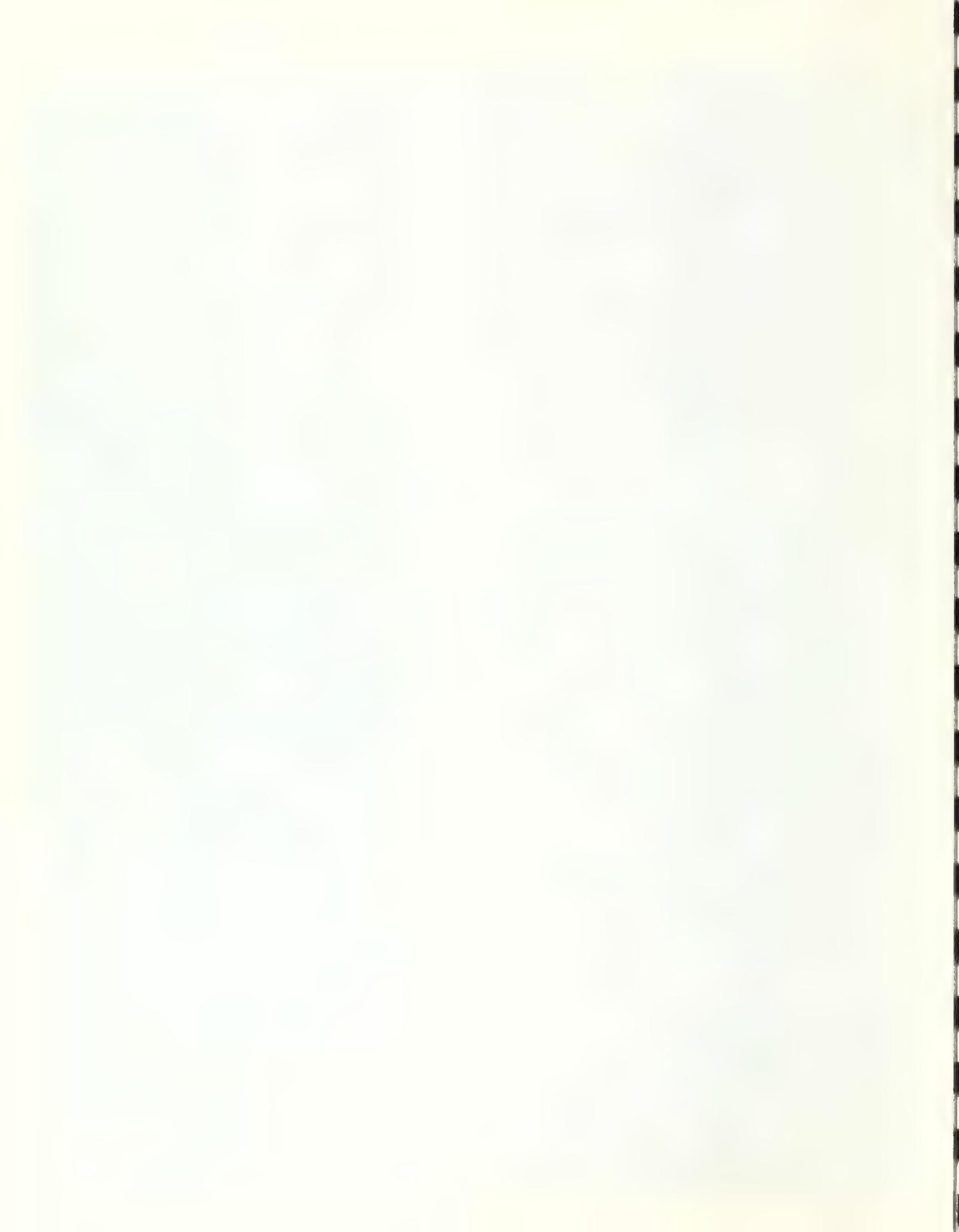
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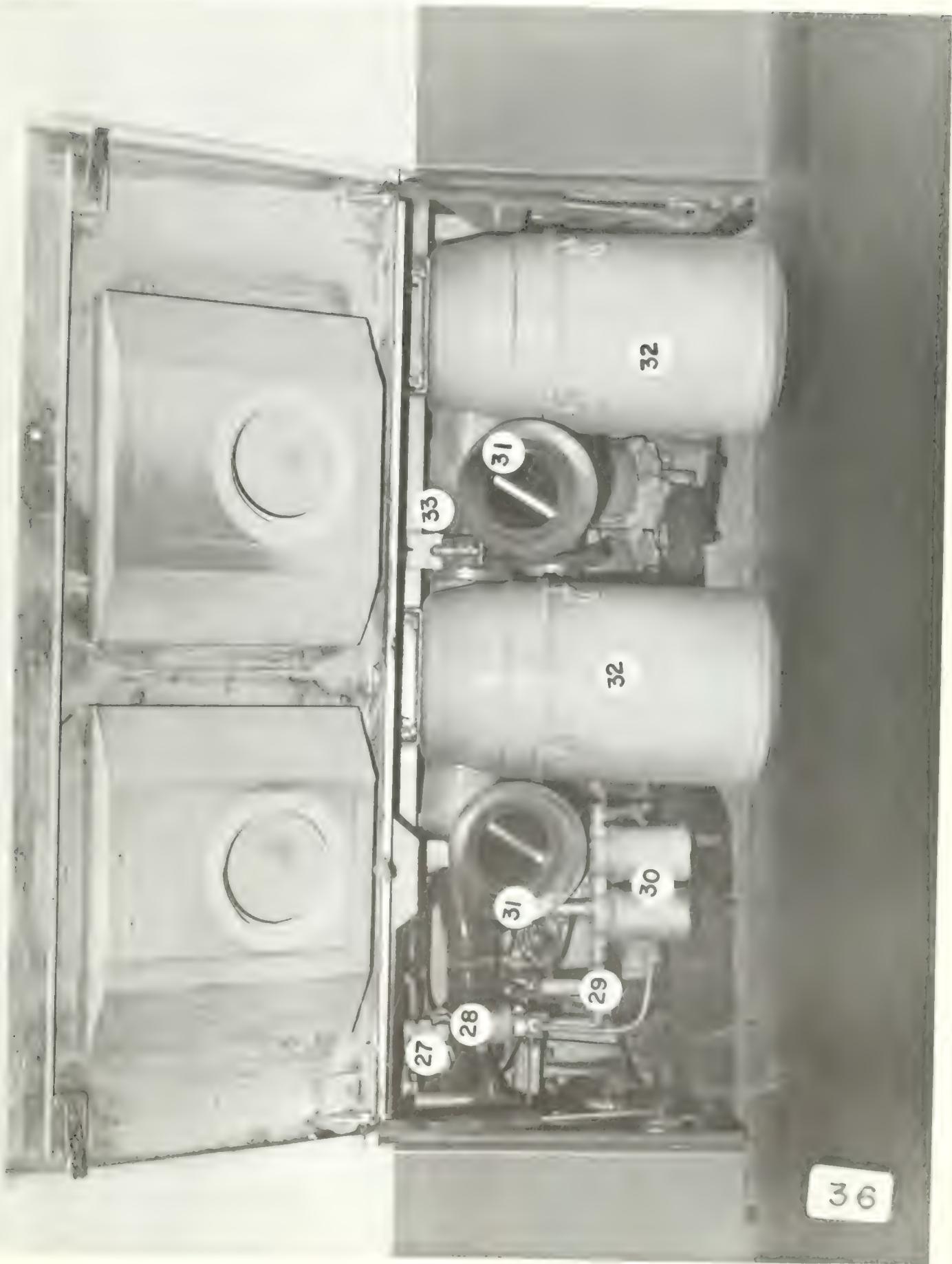


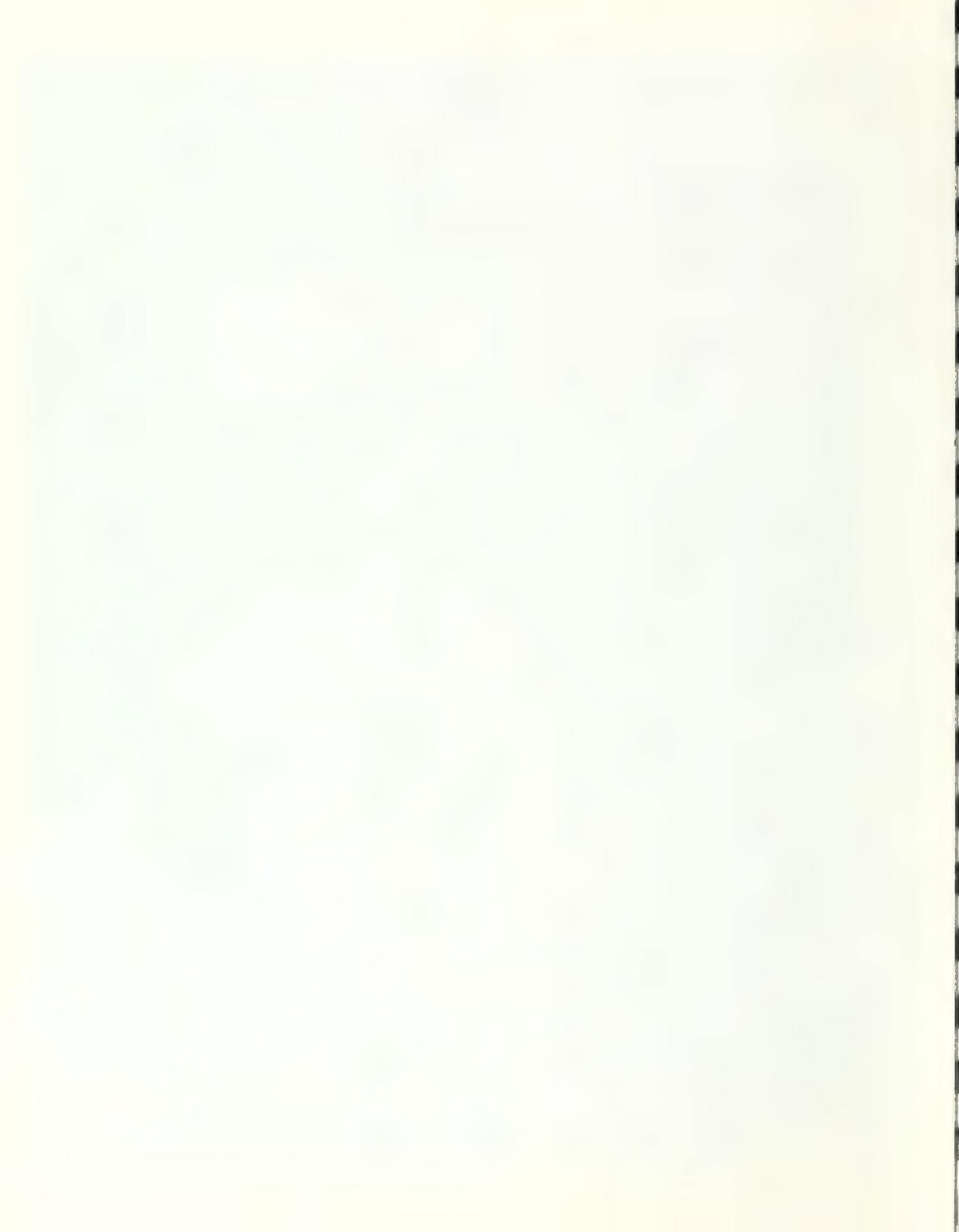


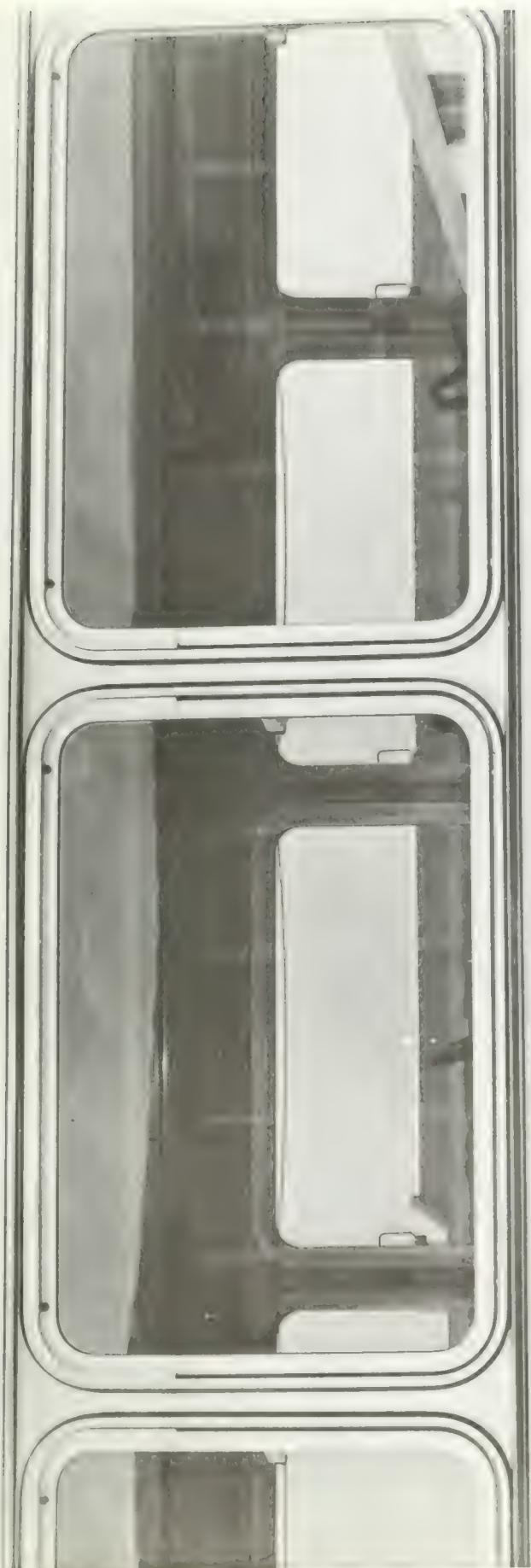
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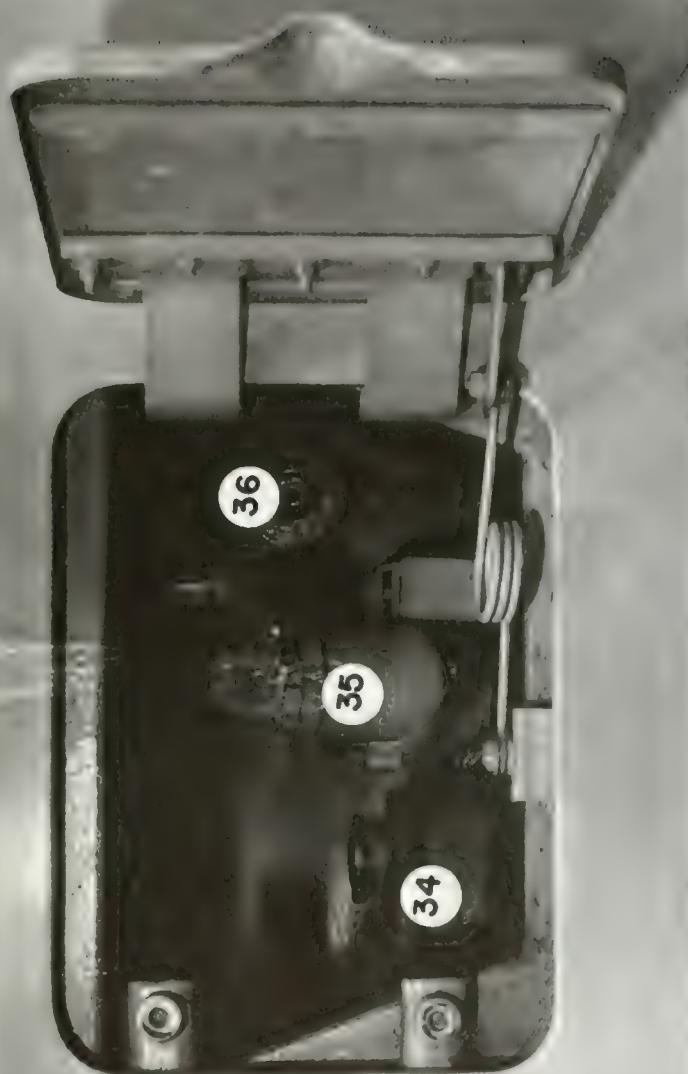






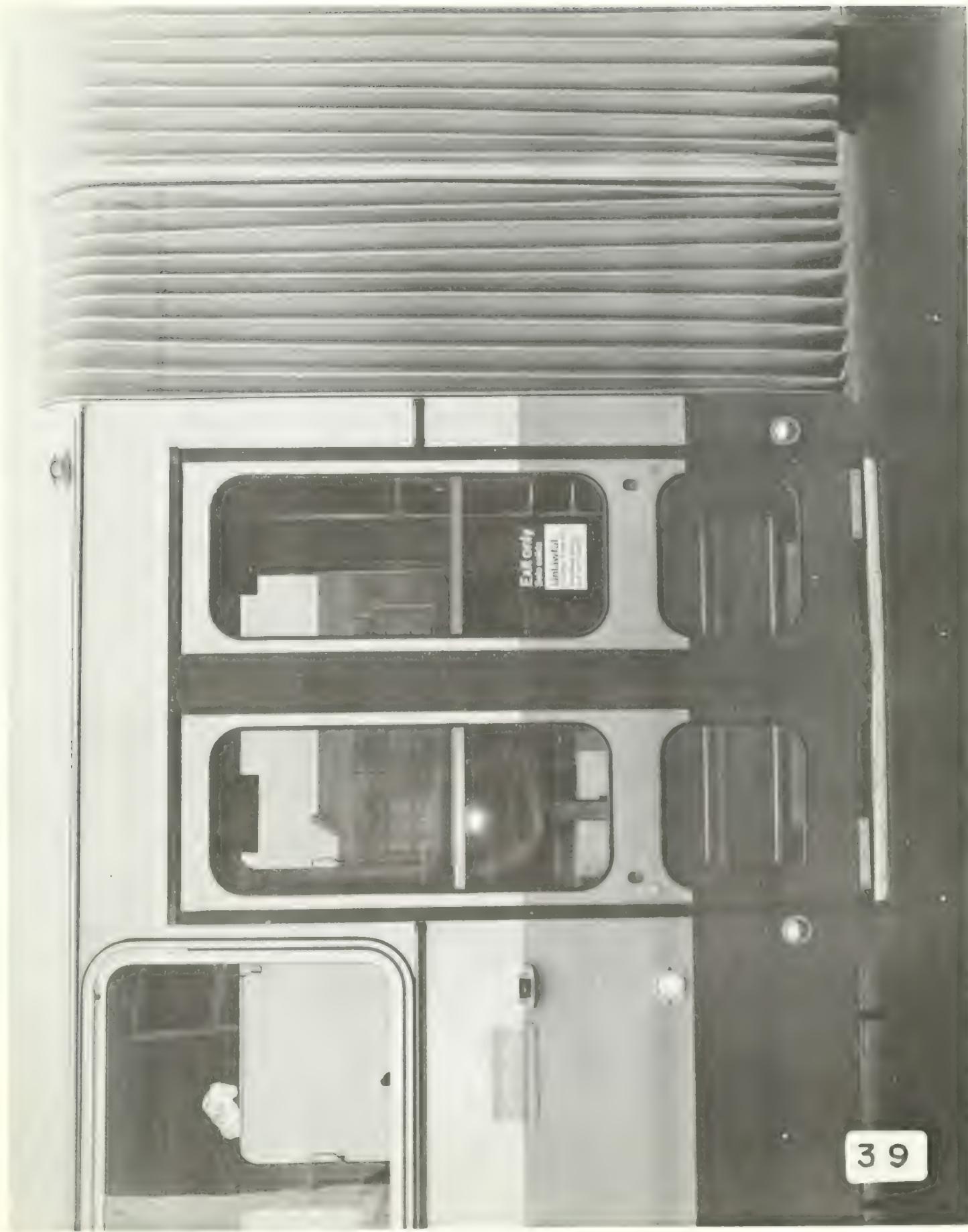


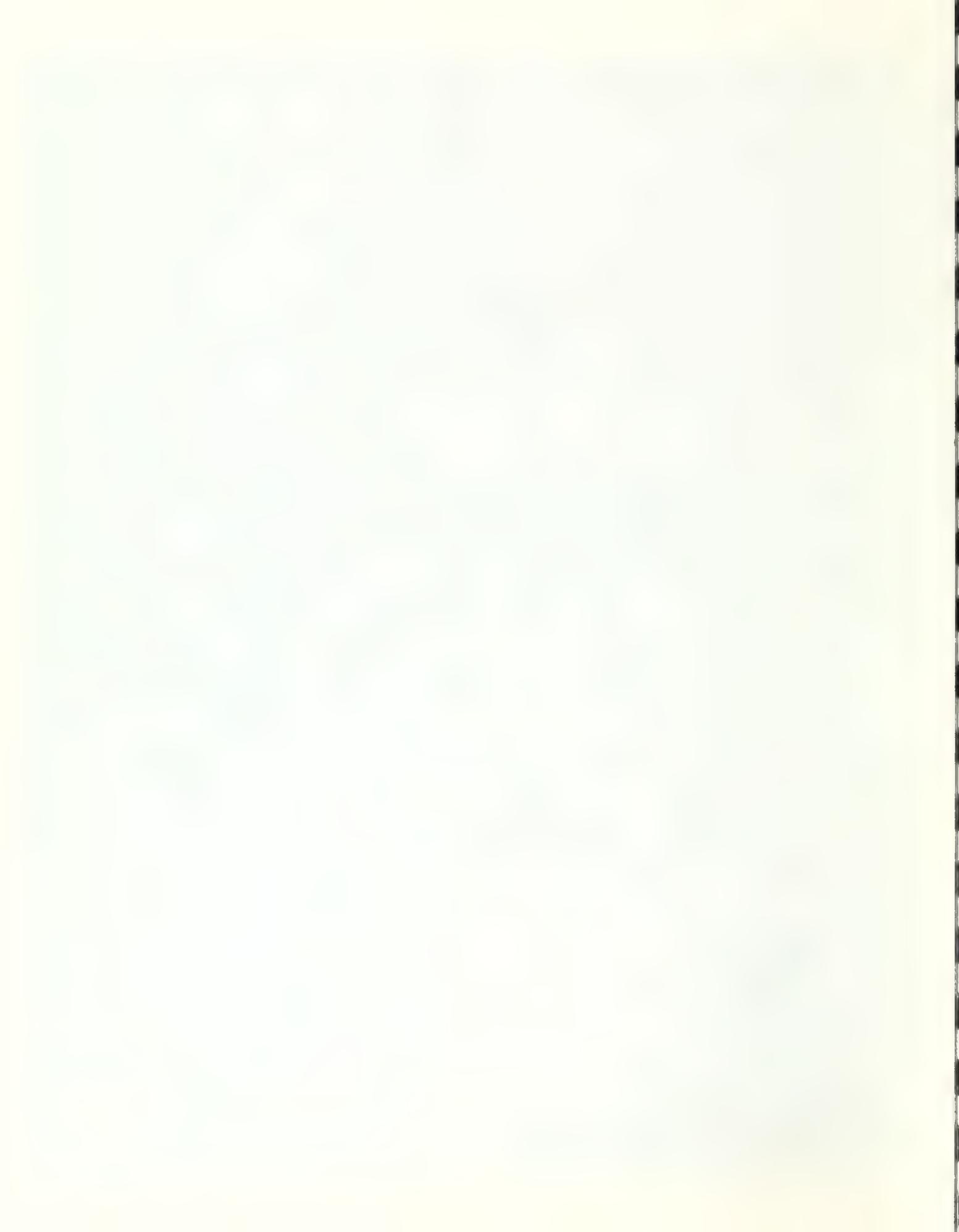


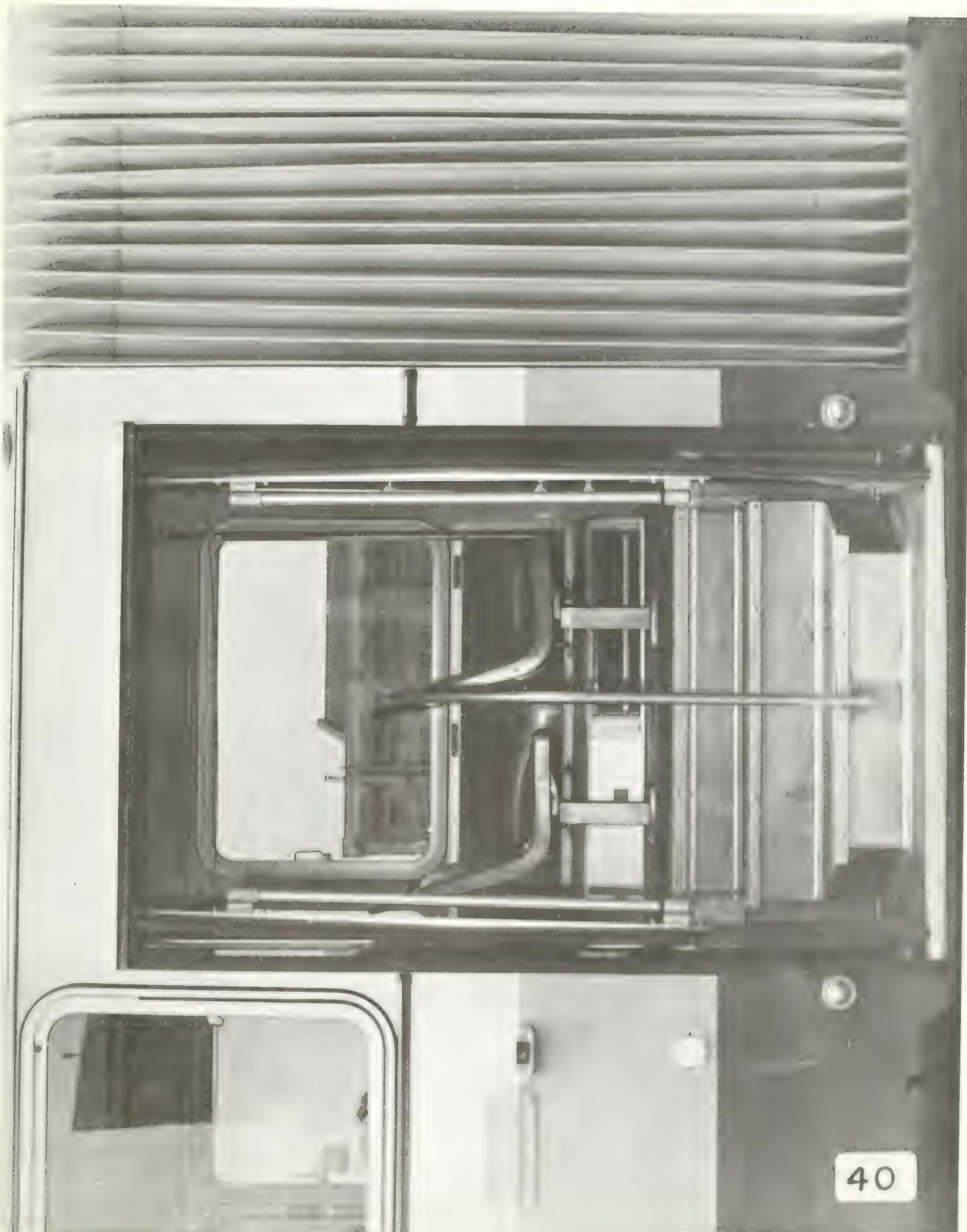


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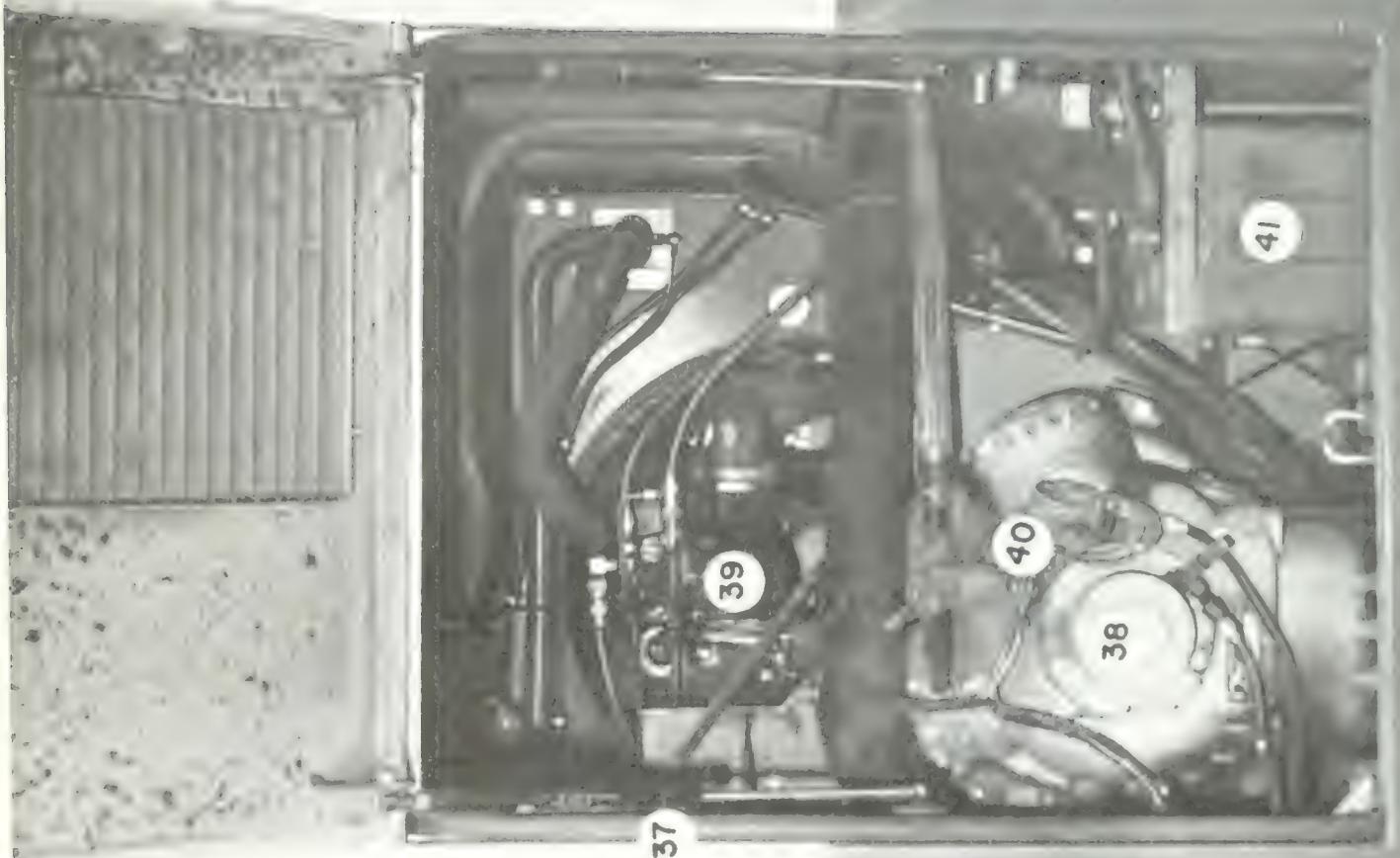
cta 7002



7002



1002

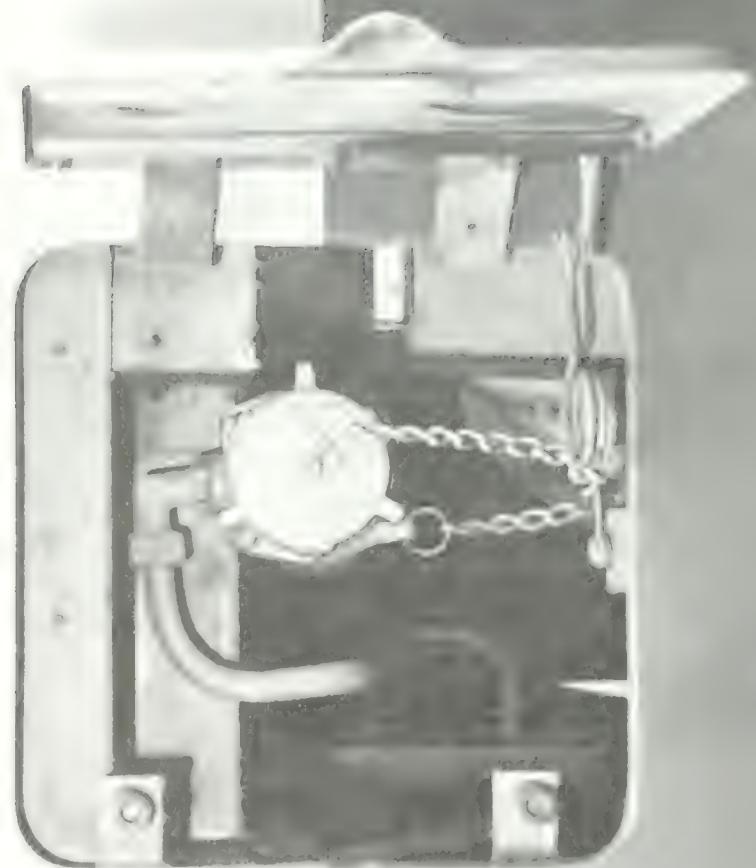


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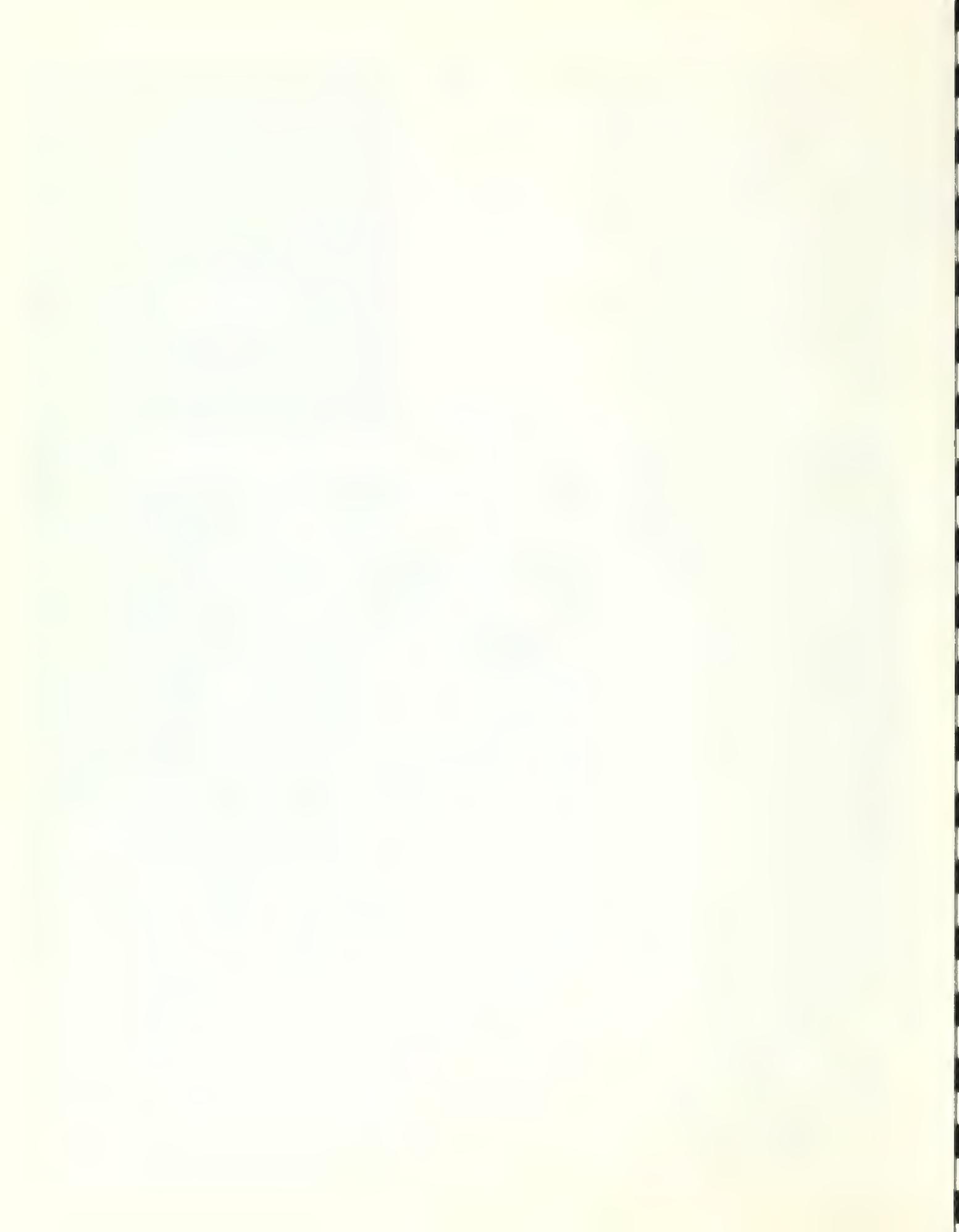


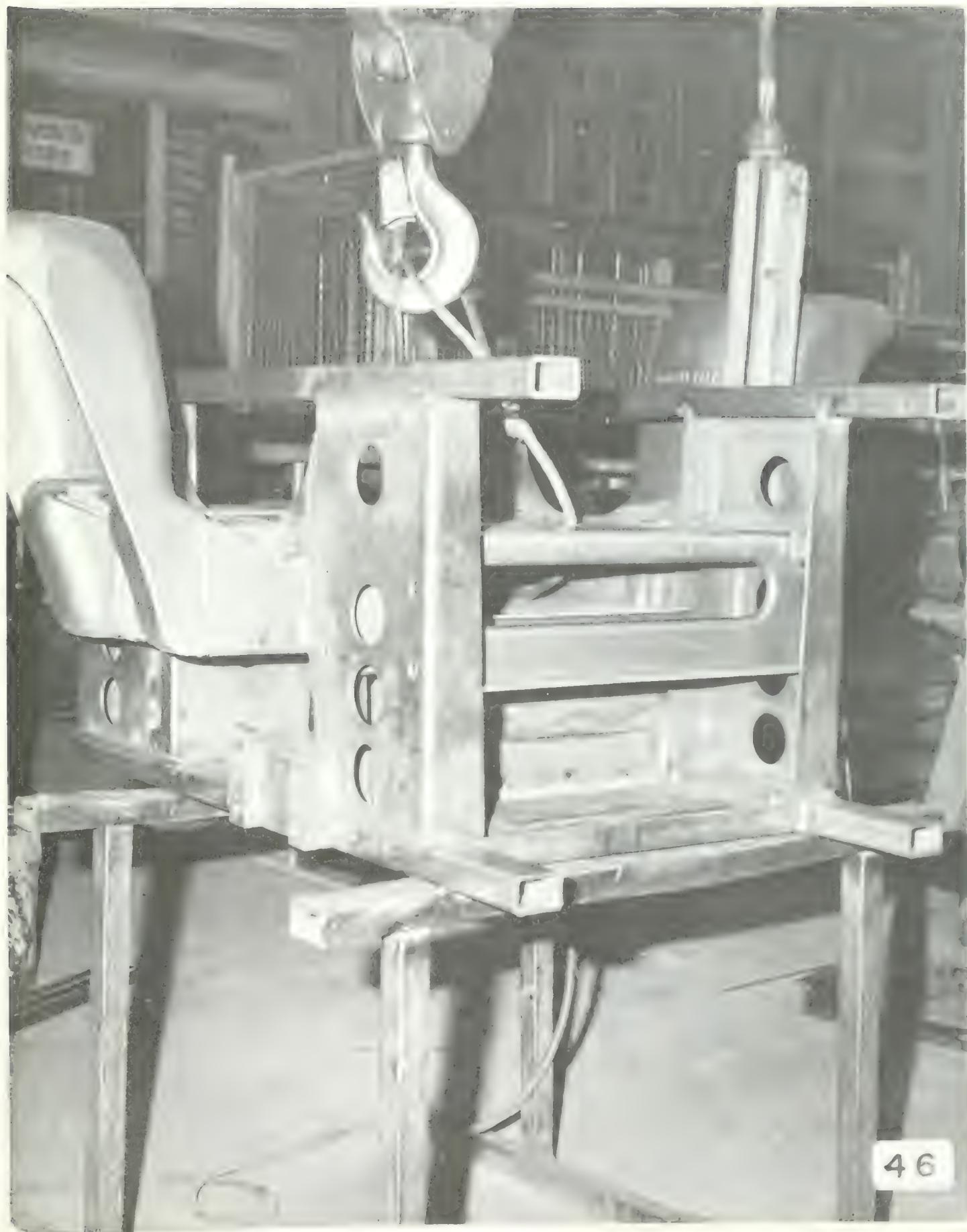
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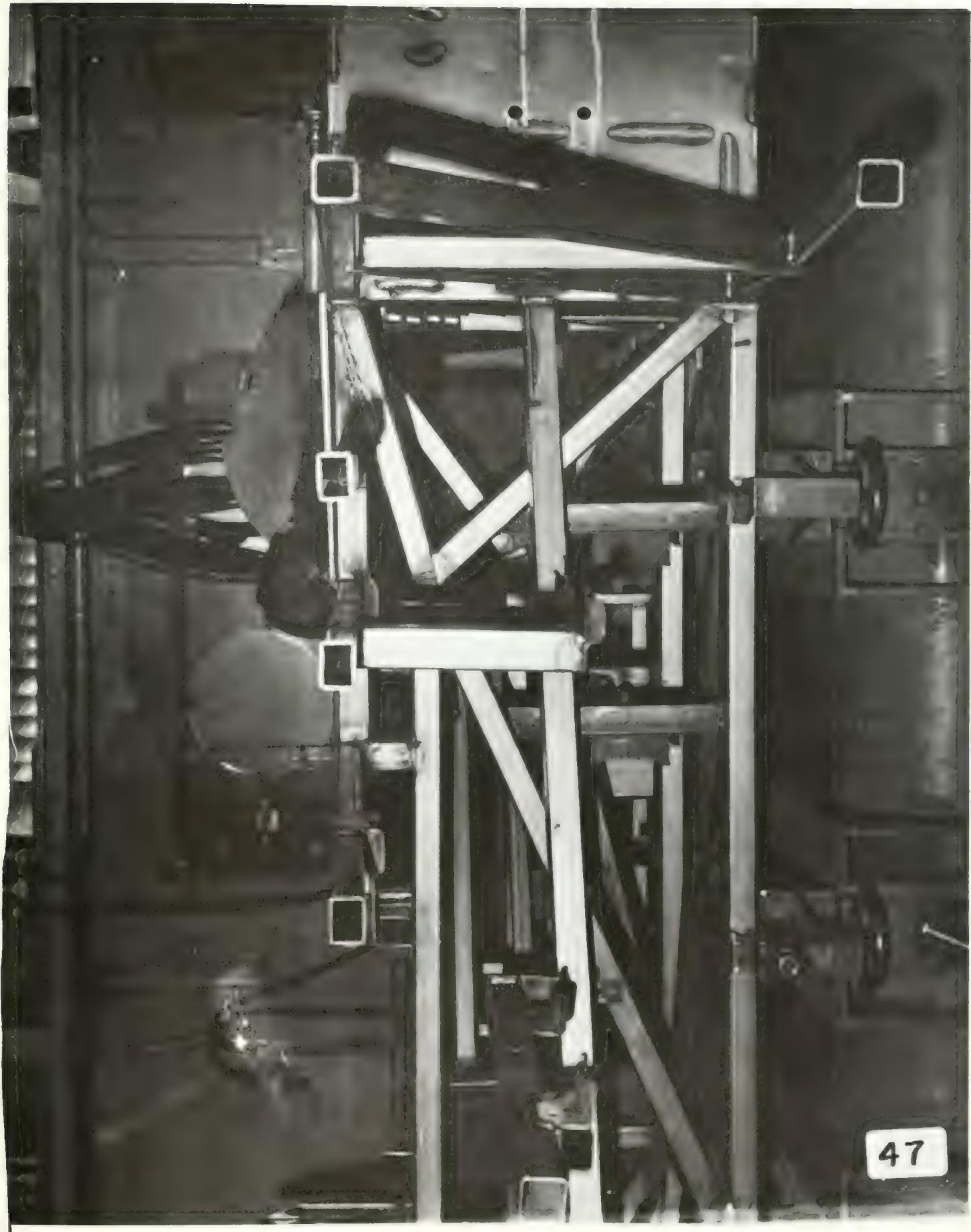


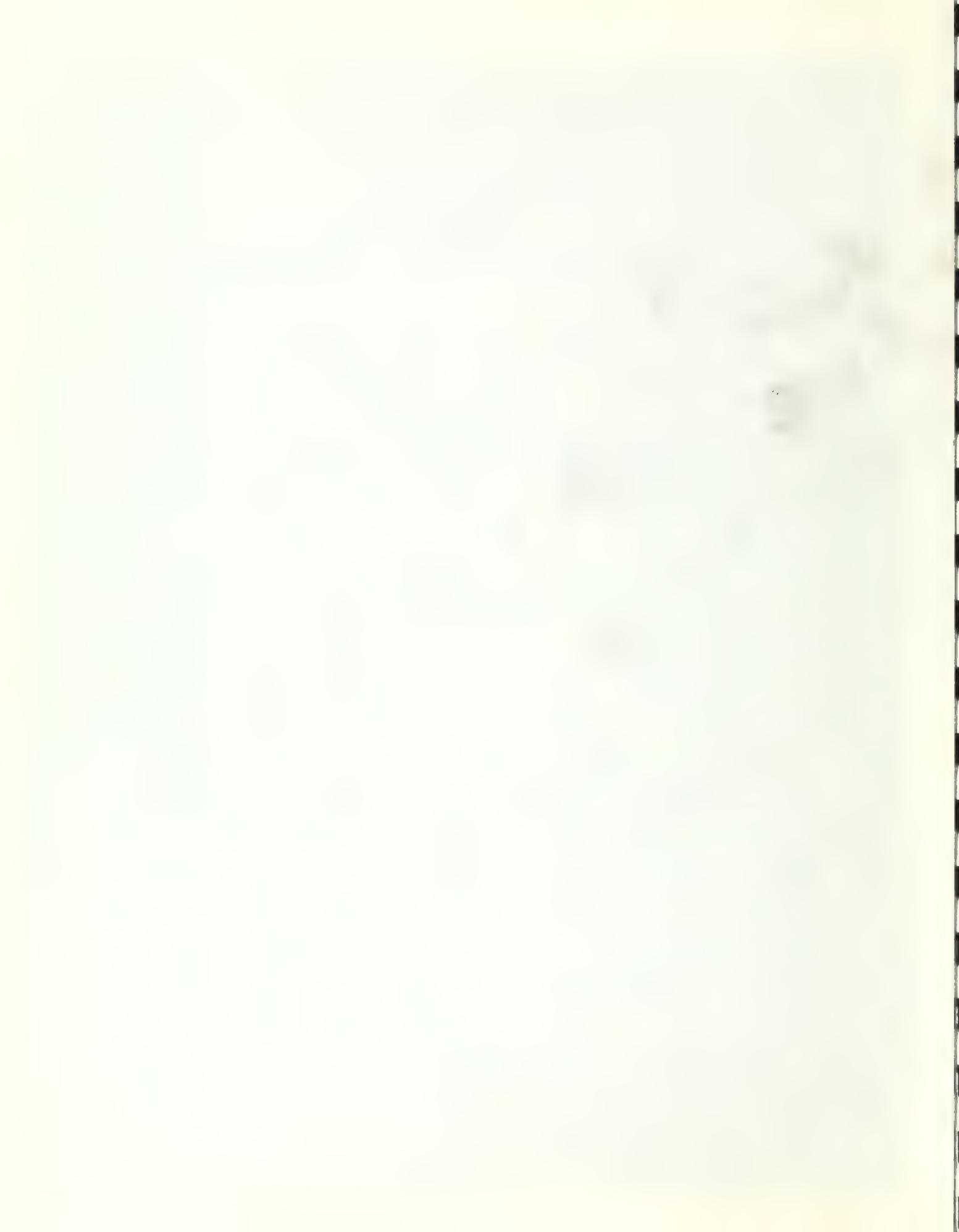
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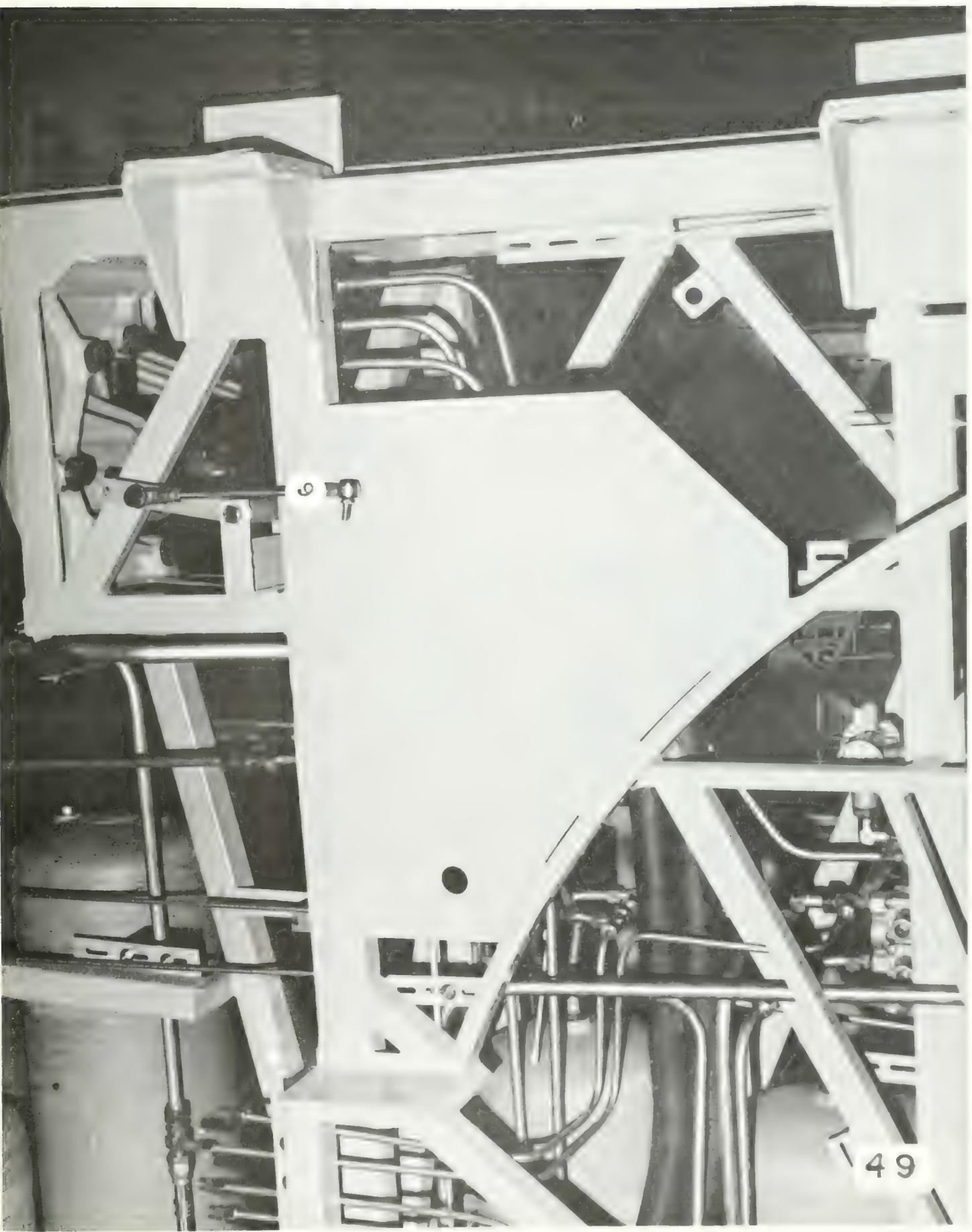


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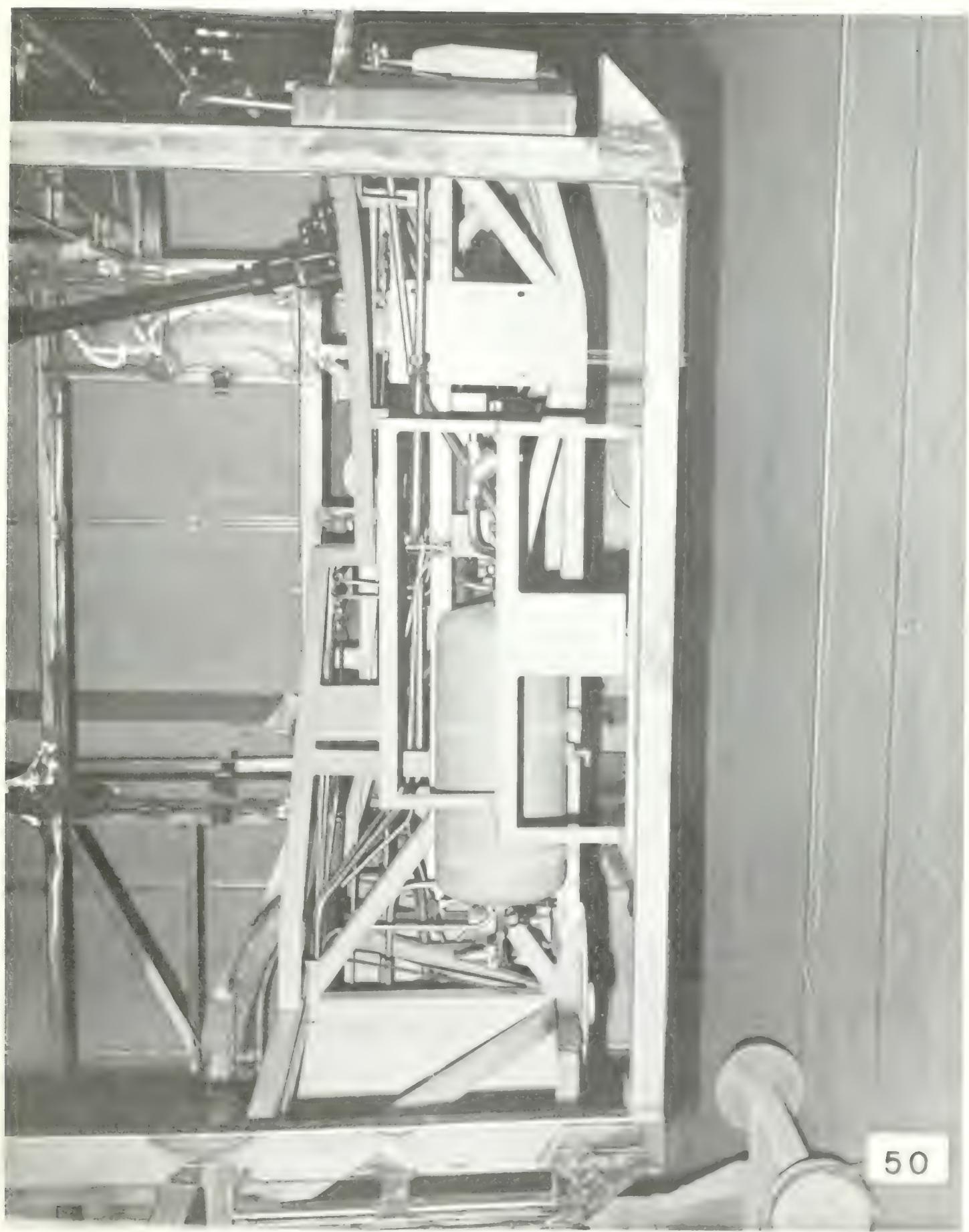






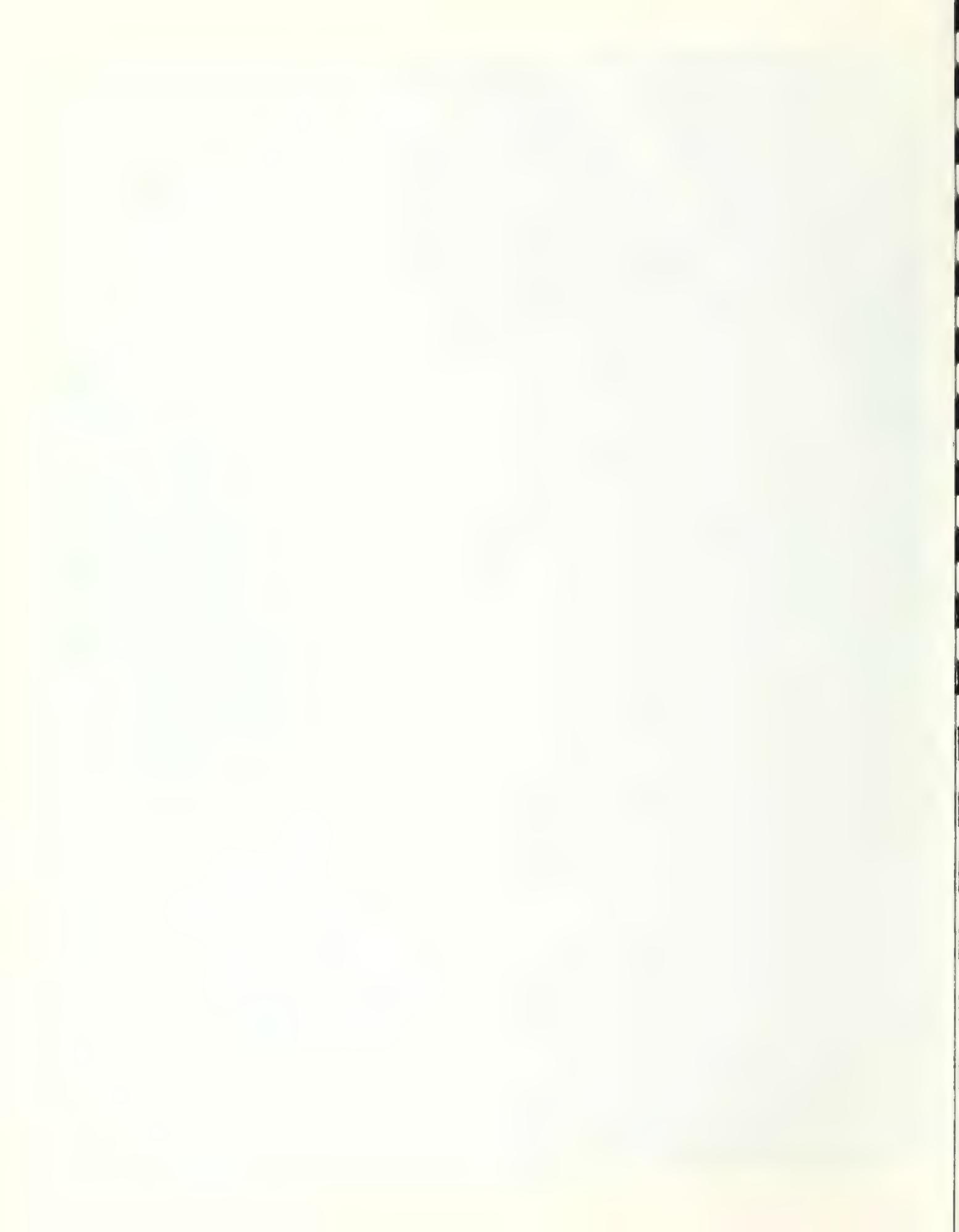




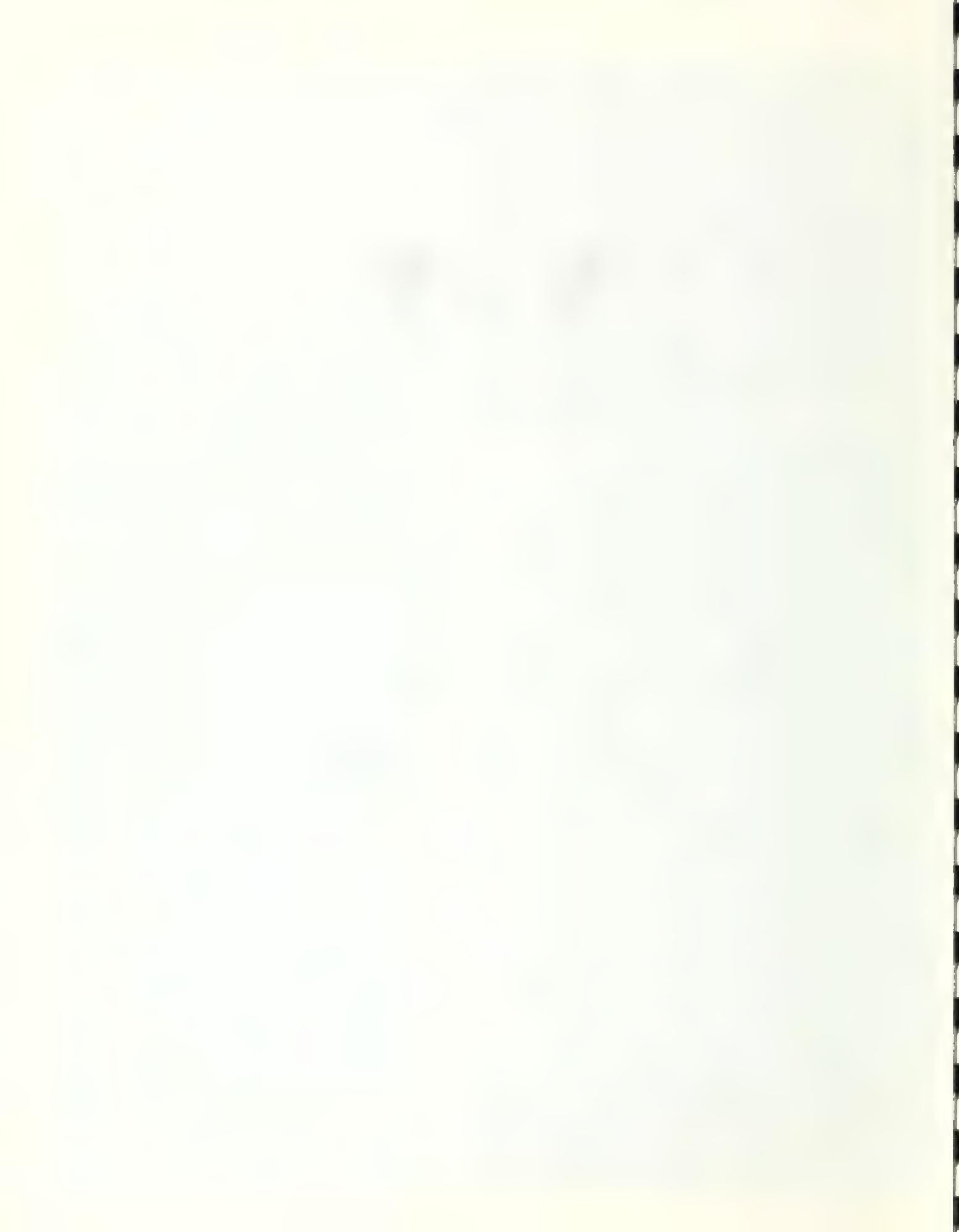




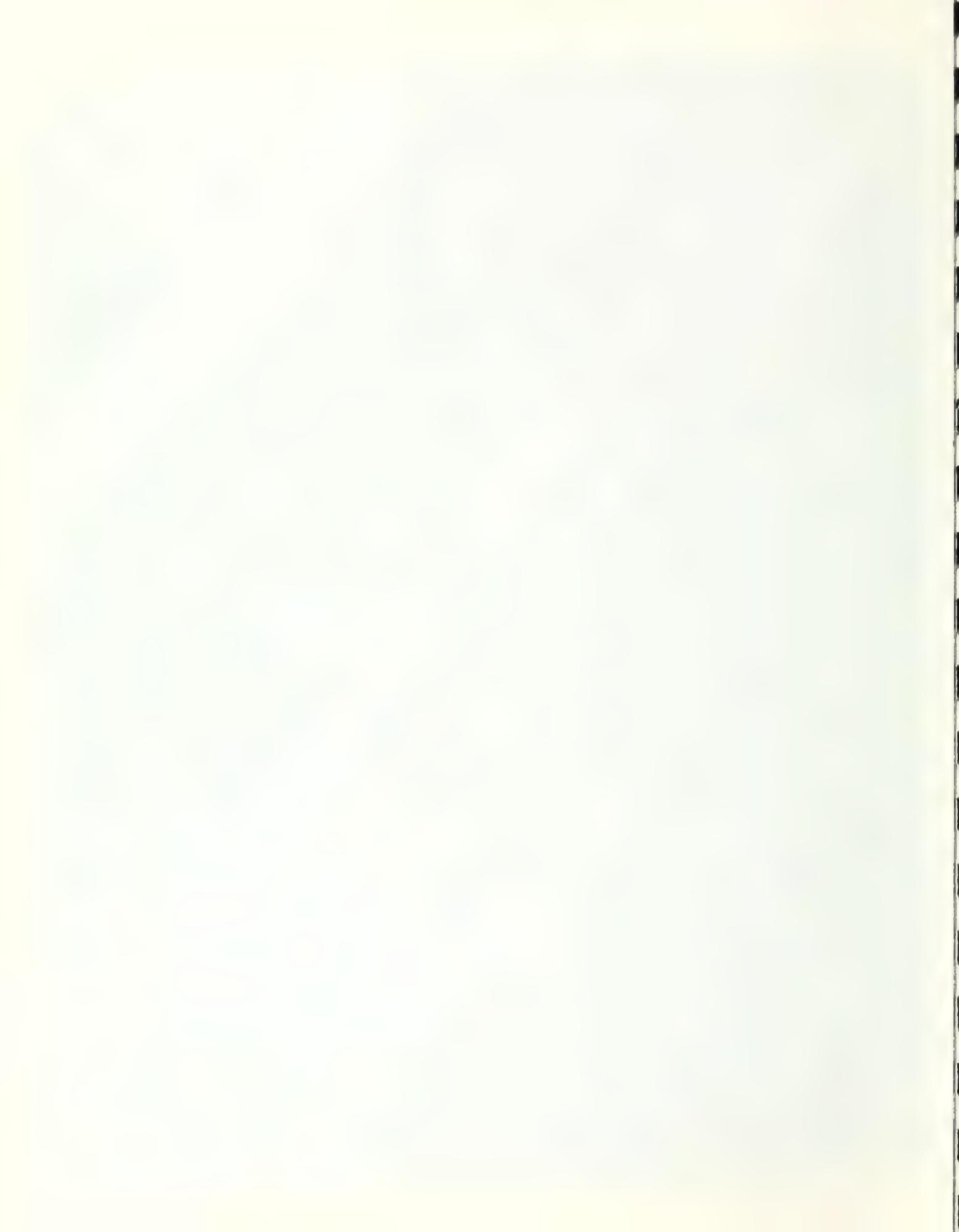
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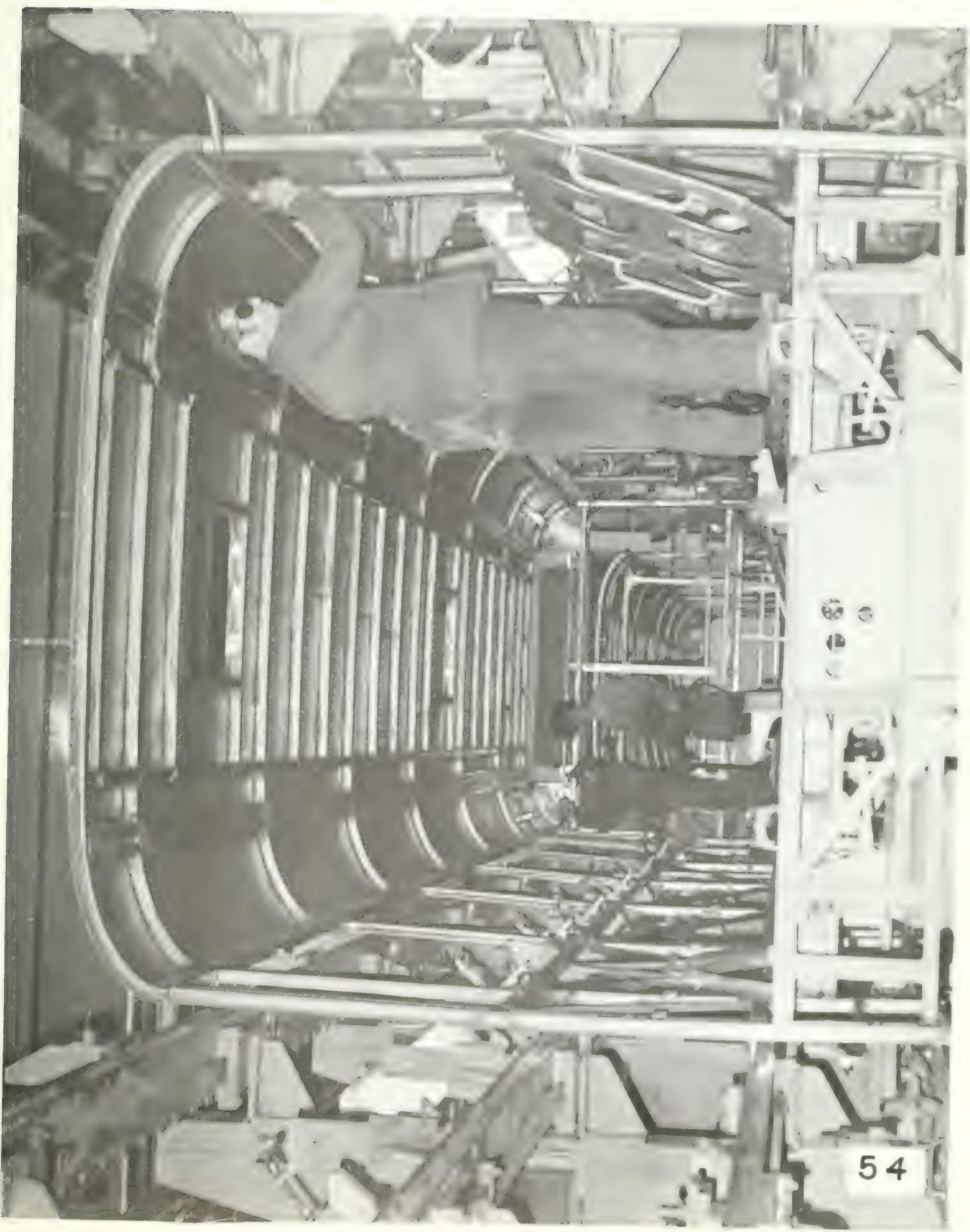


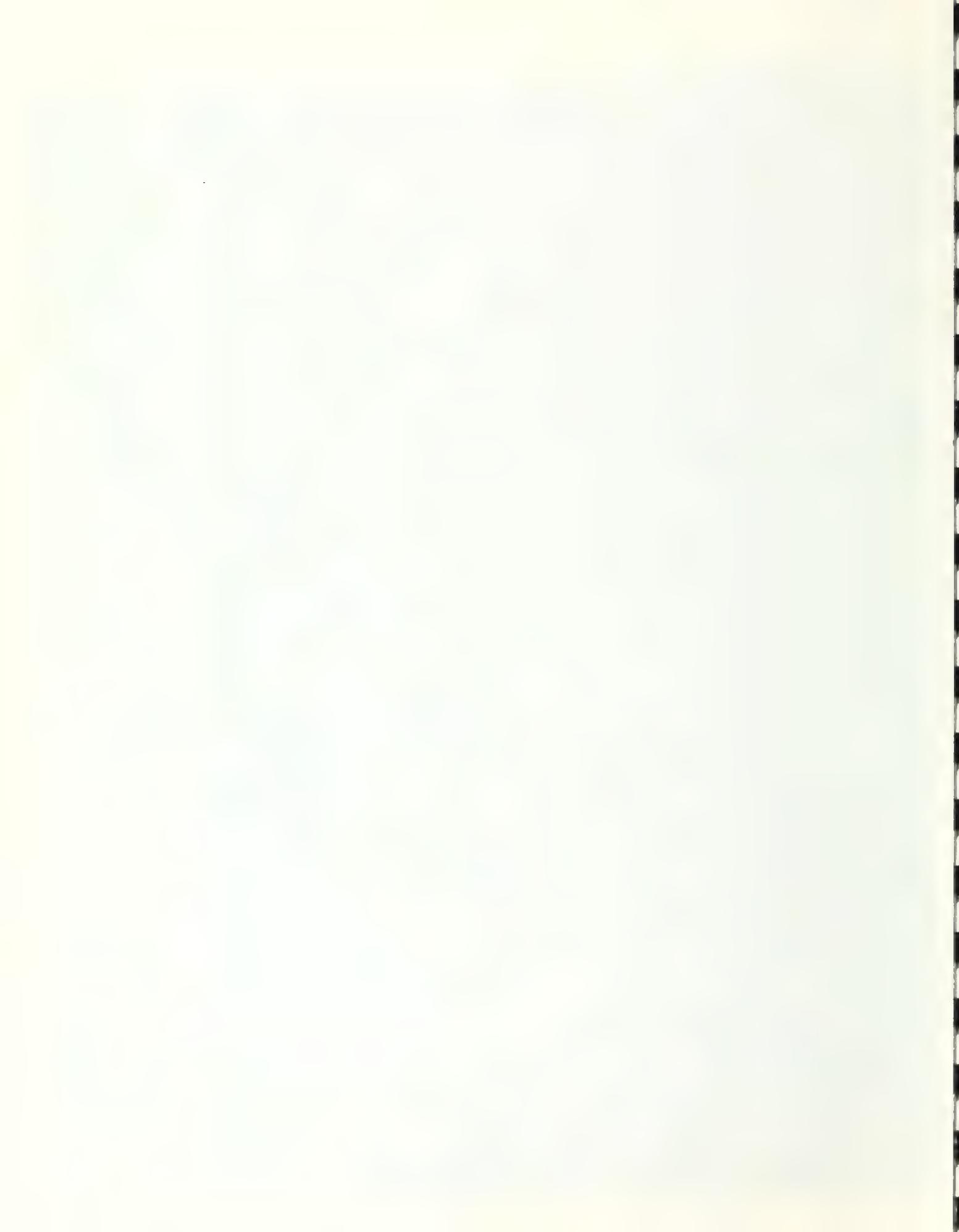


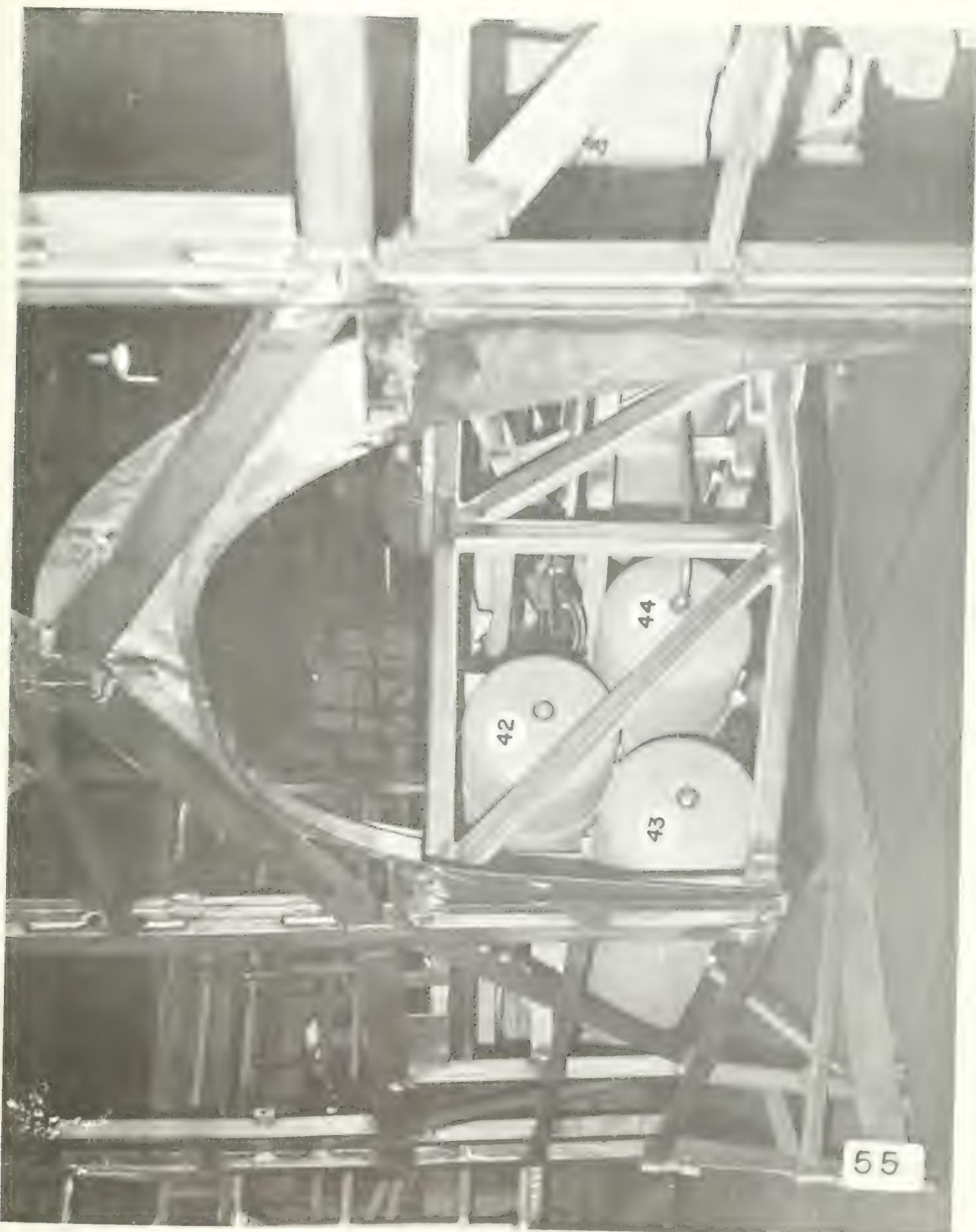




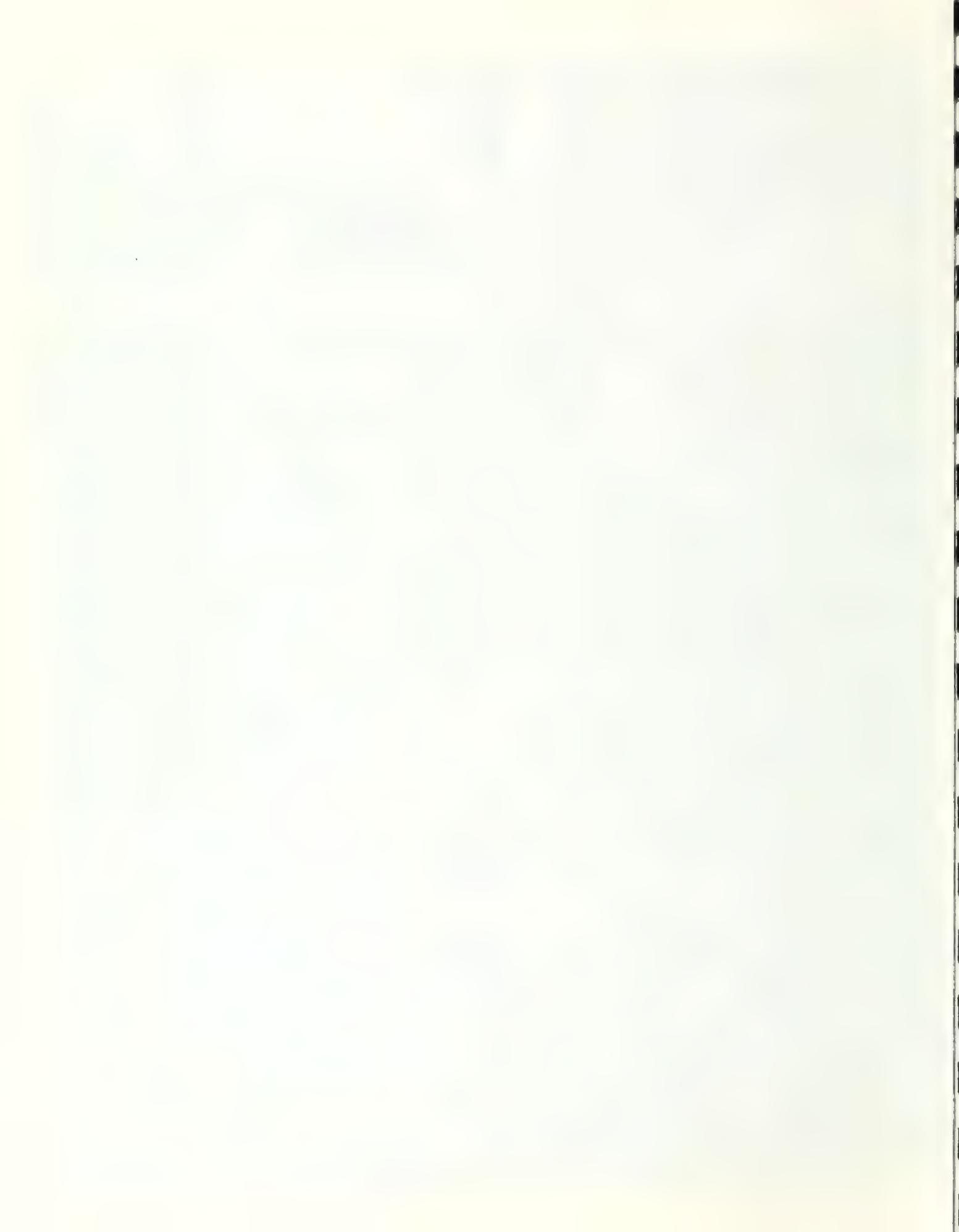


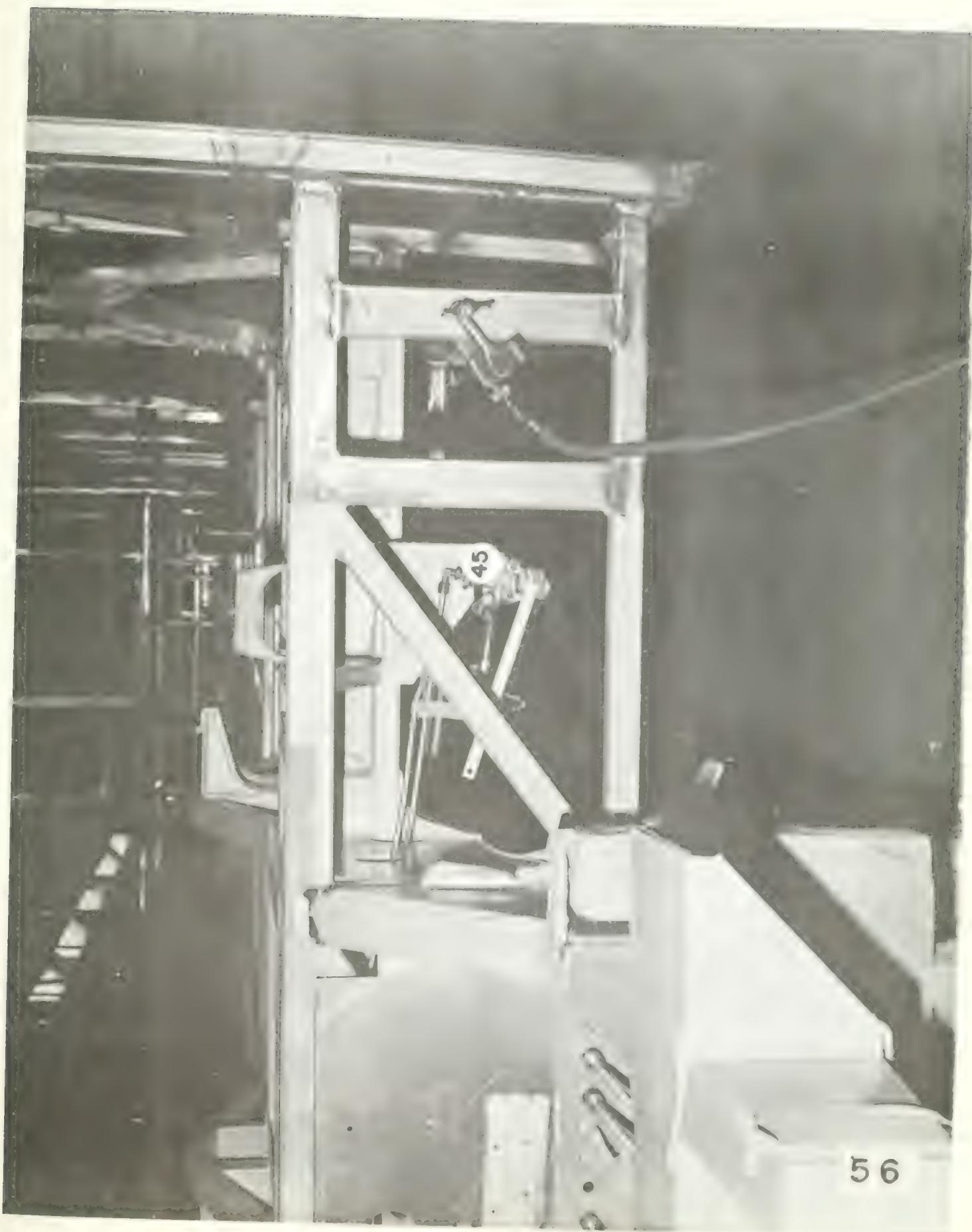






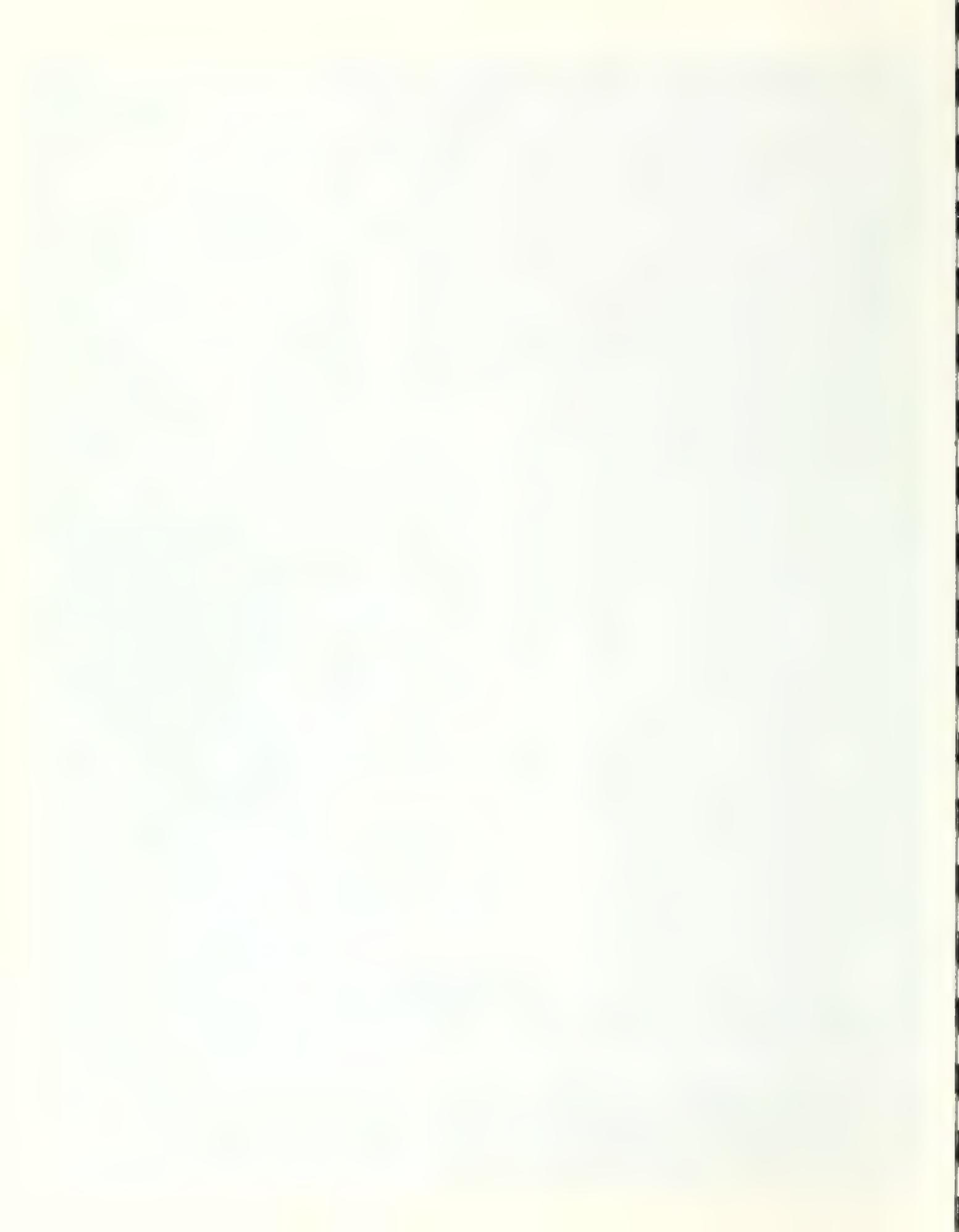
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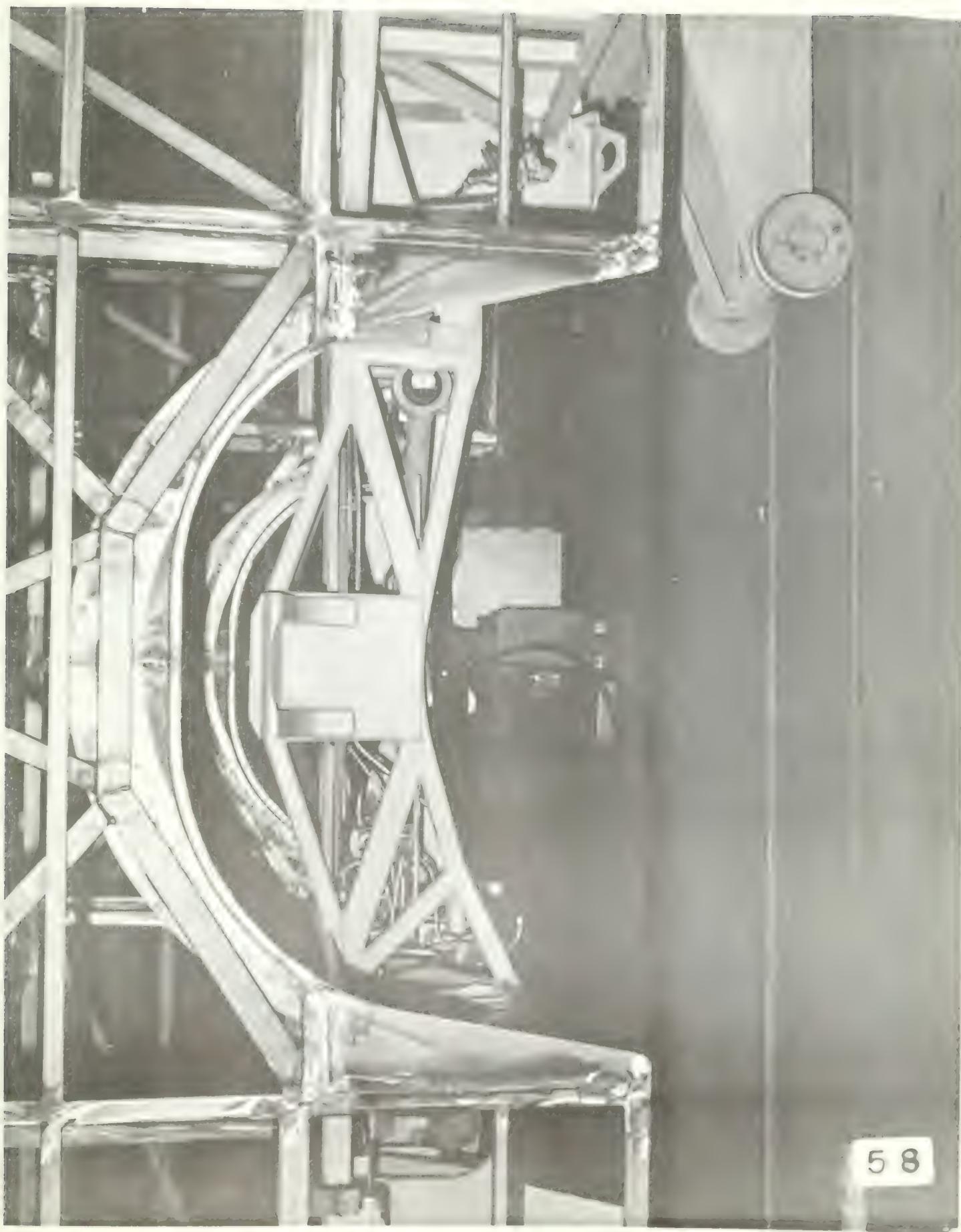




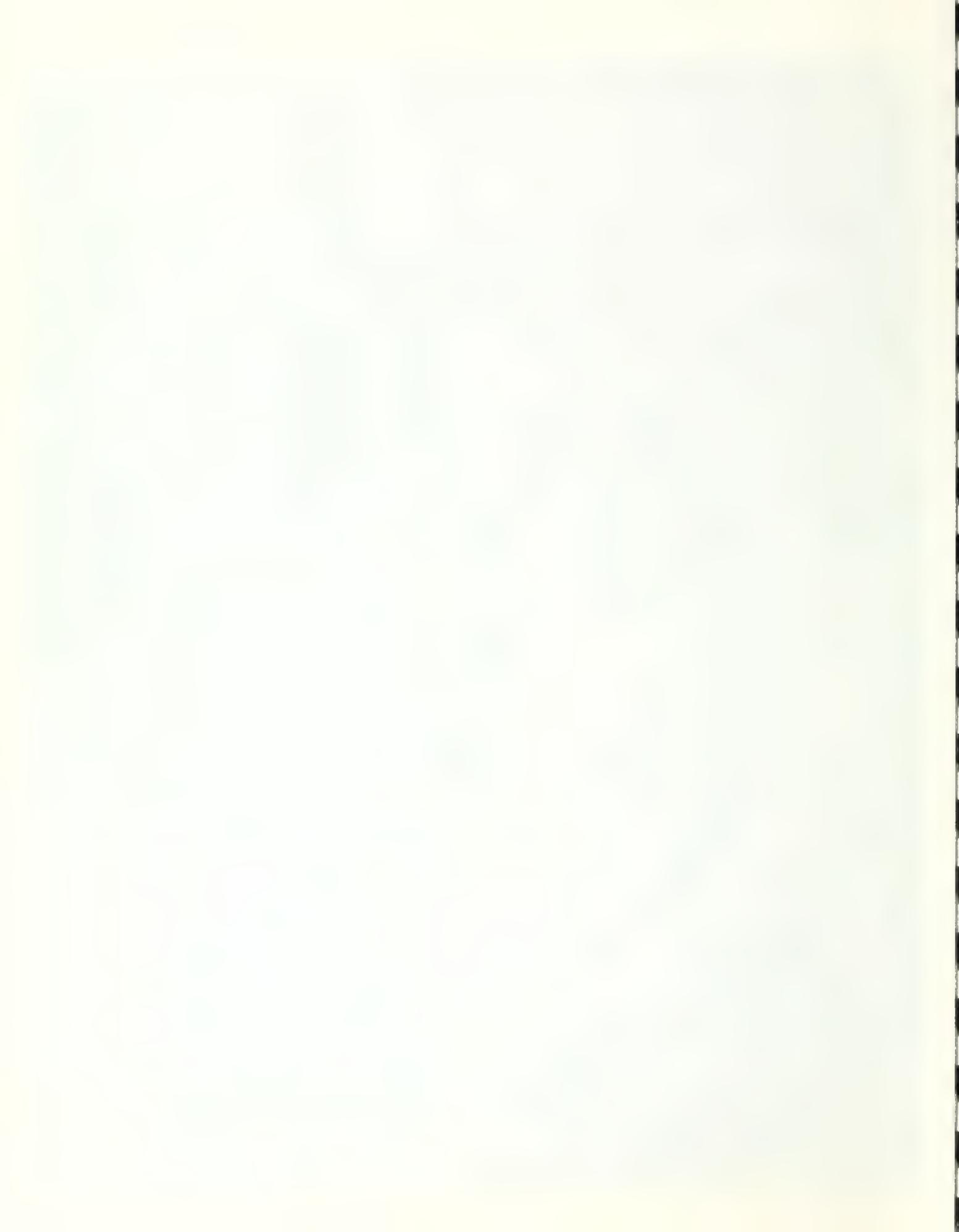


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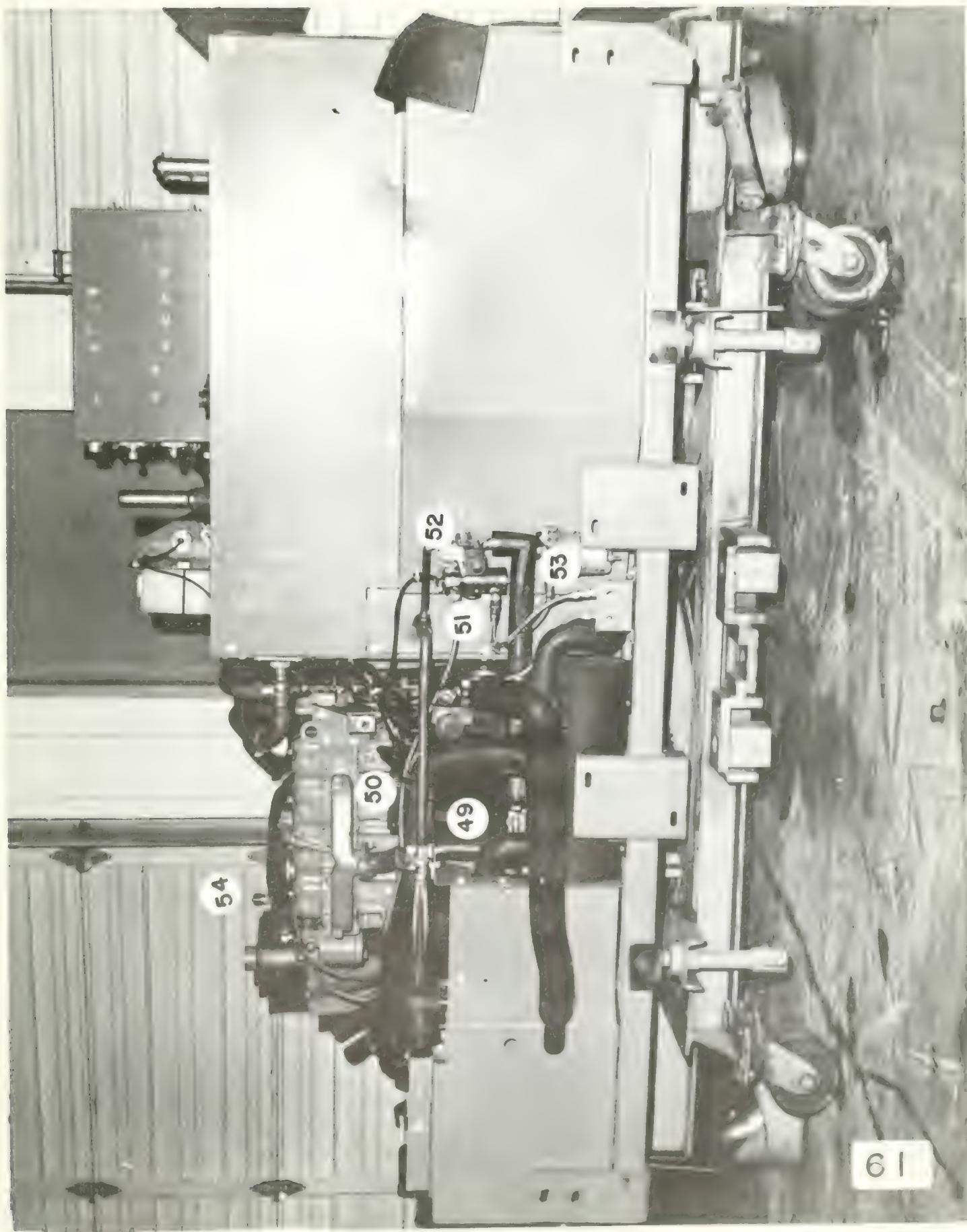
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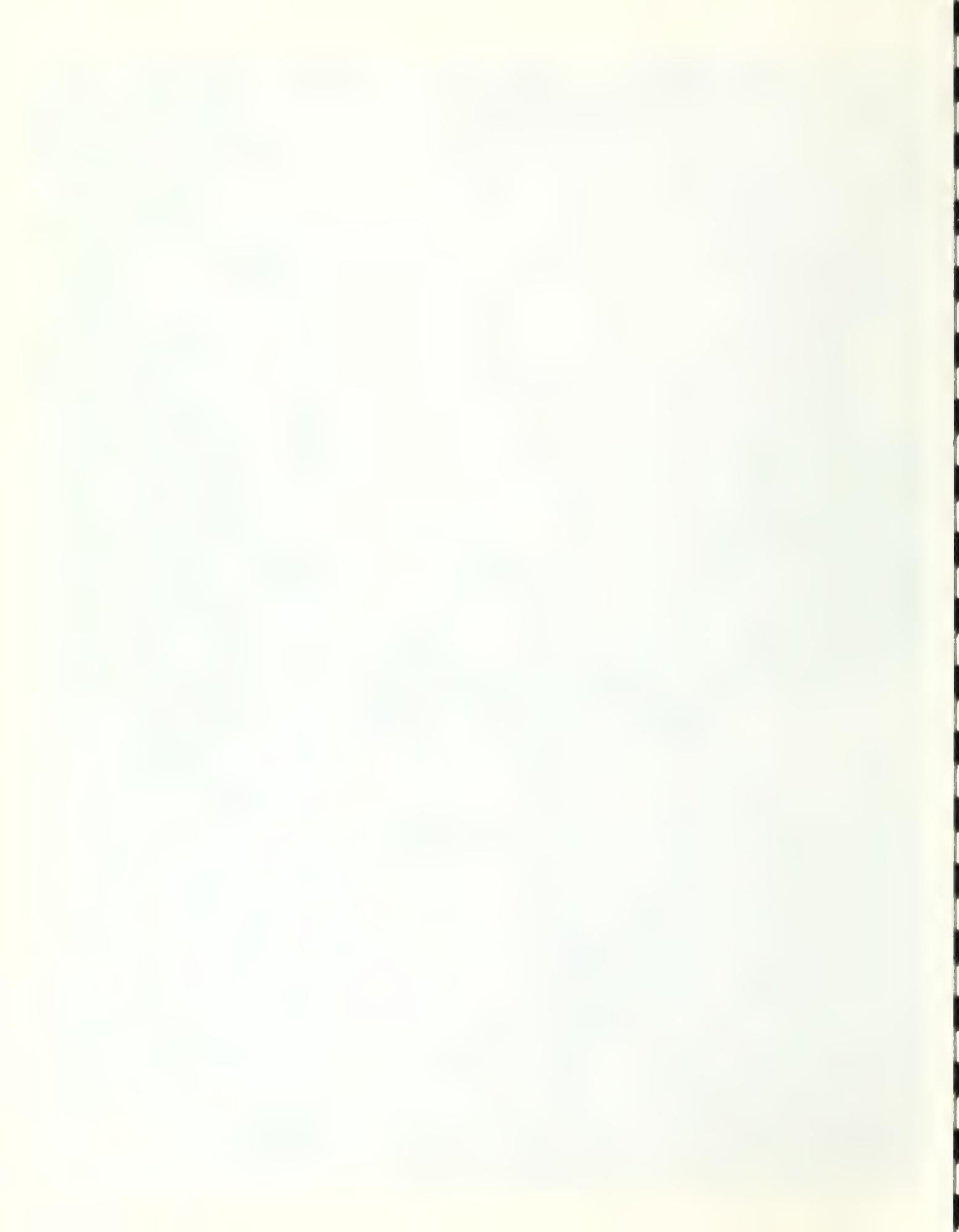


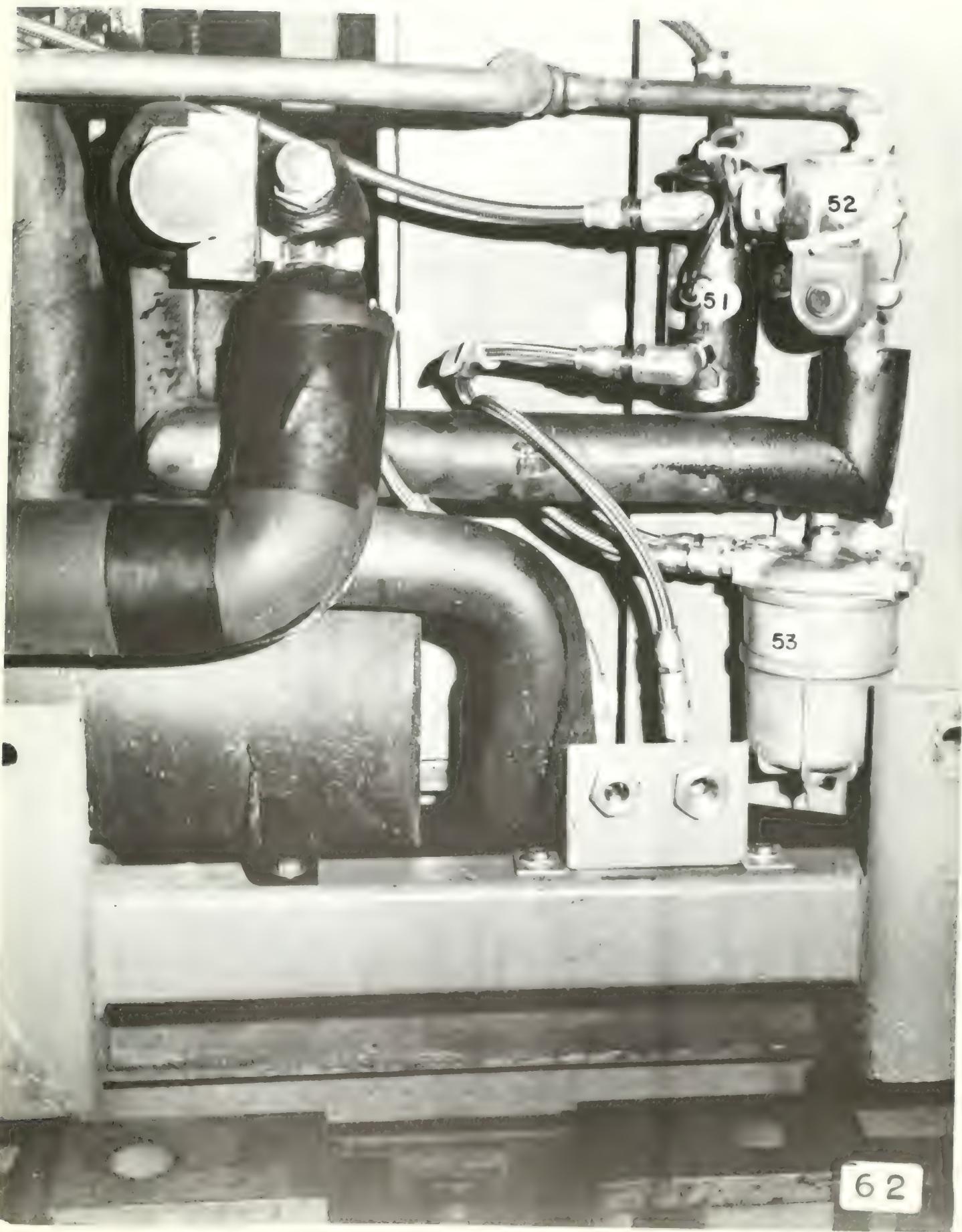


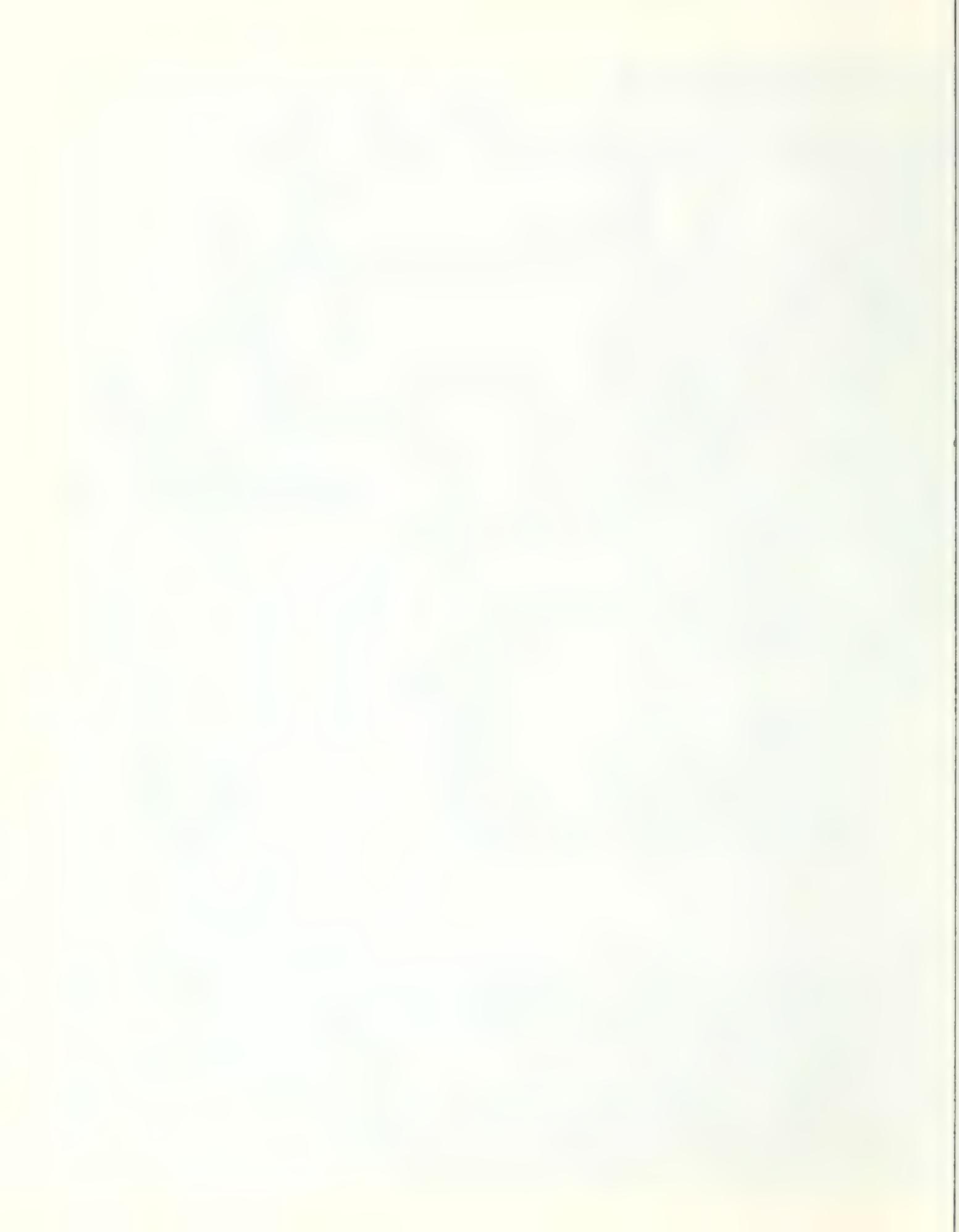
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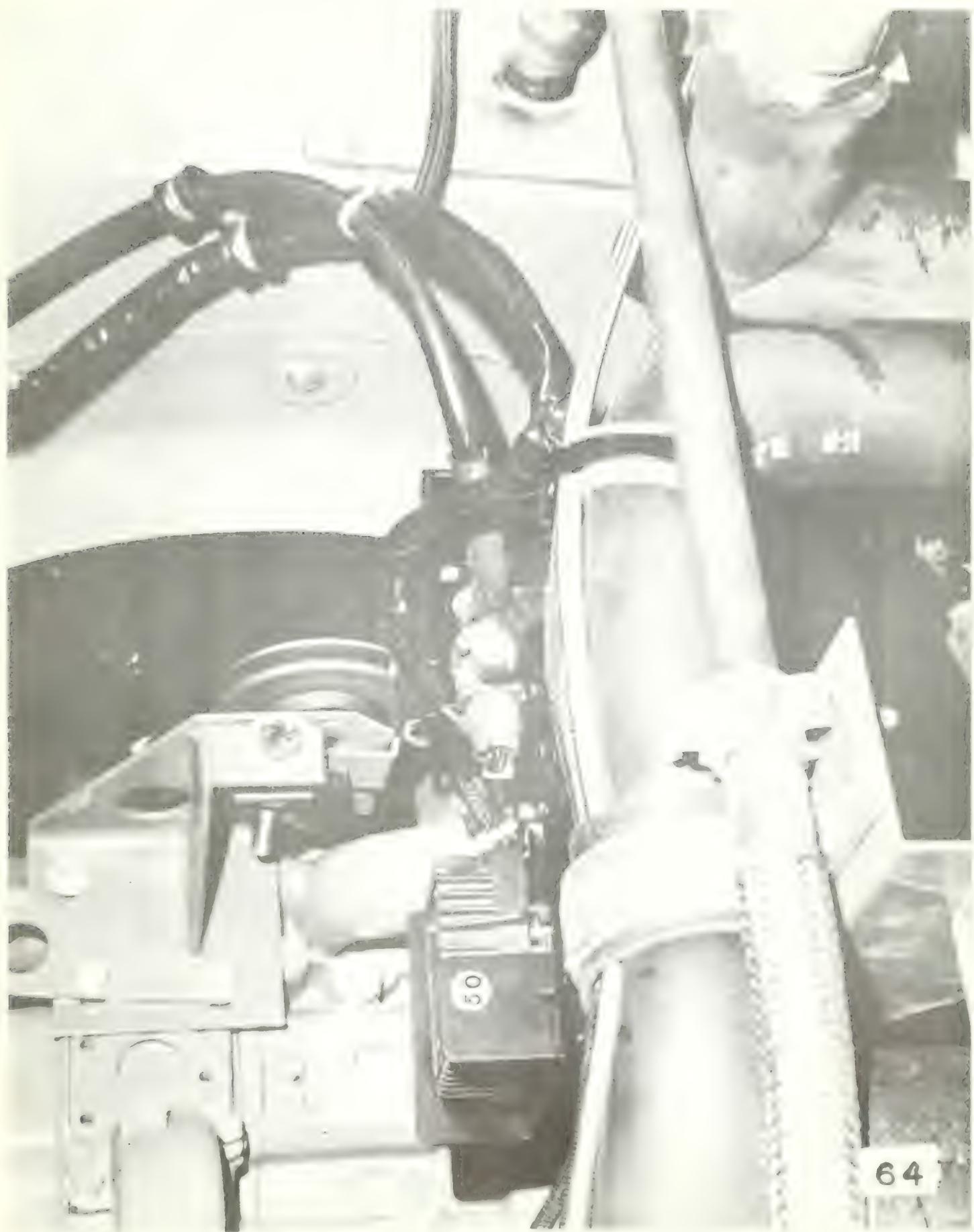




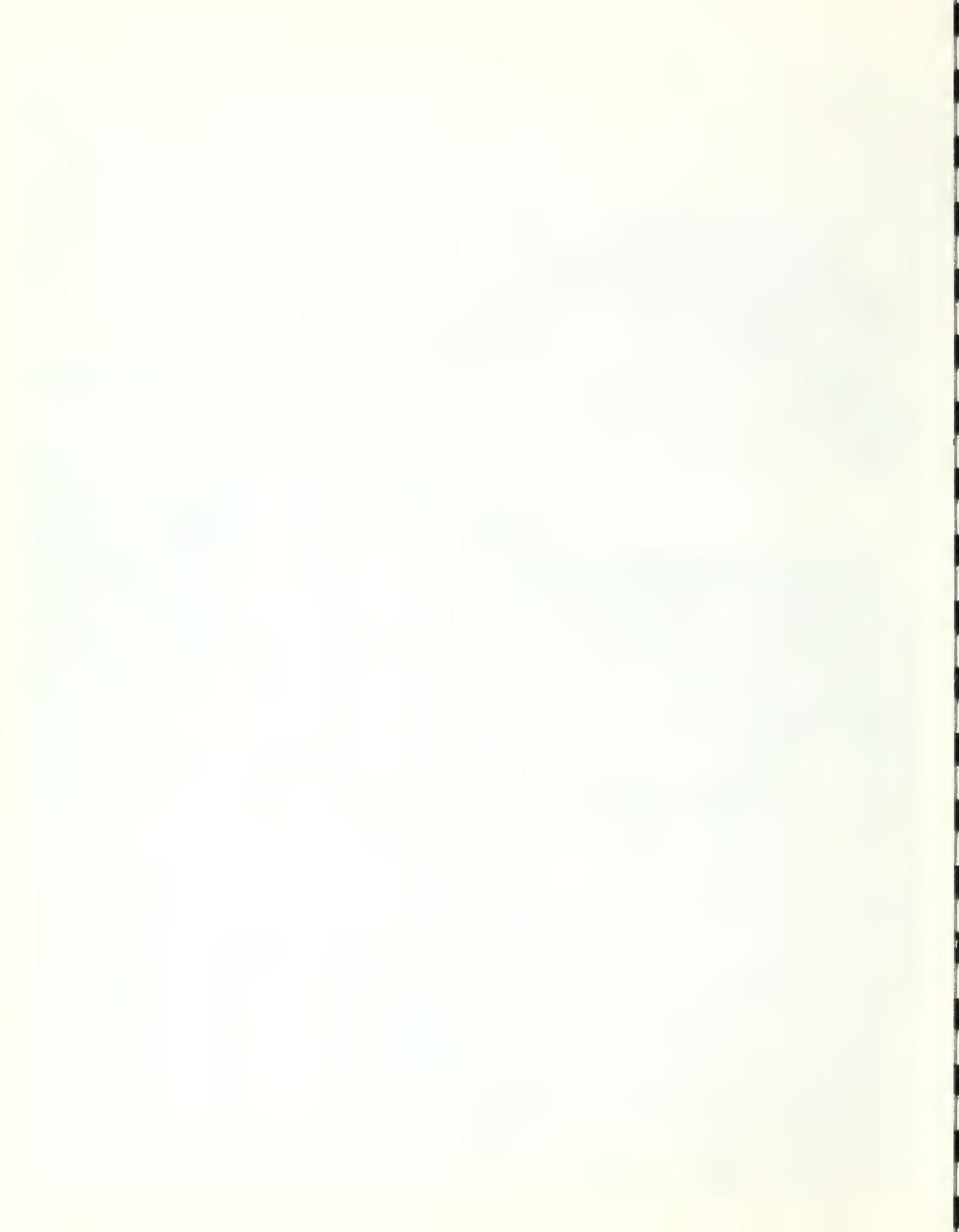




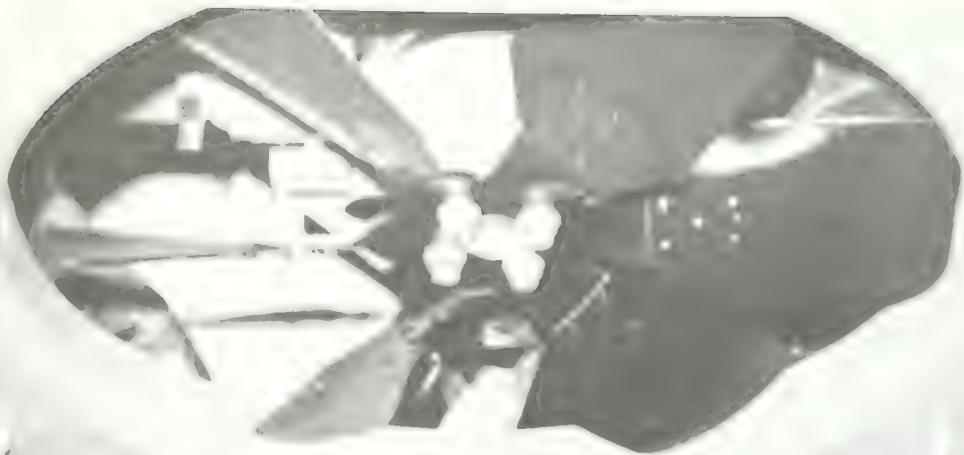
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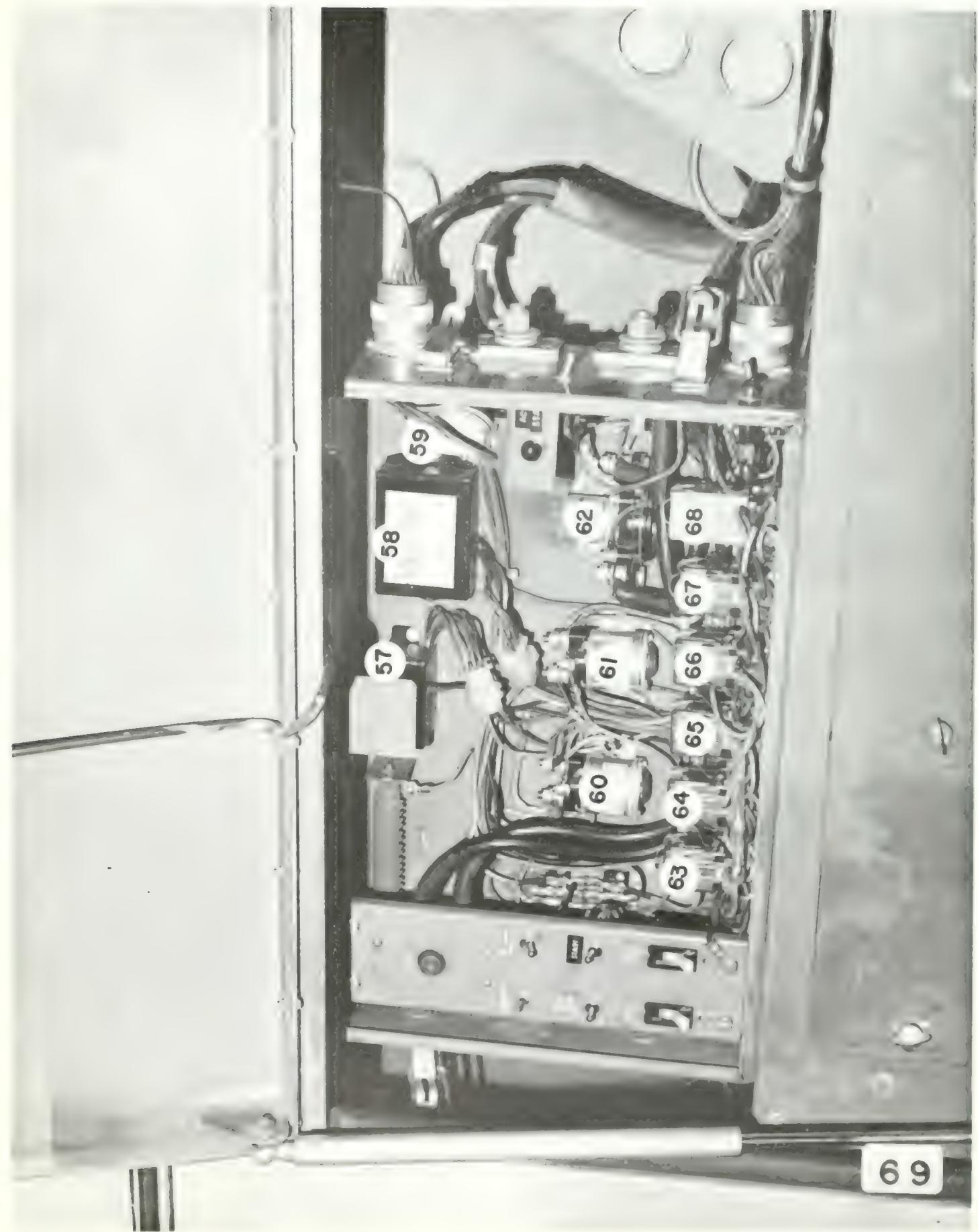
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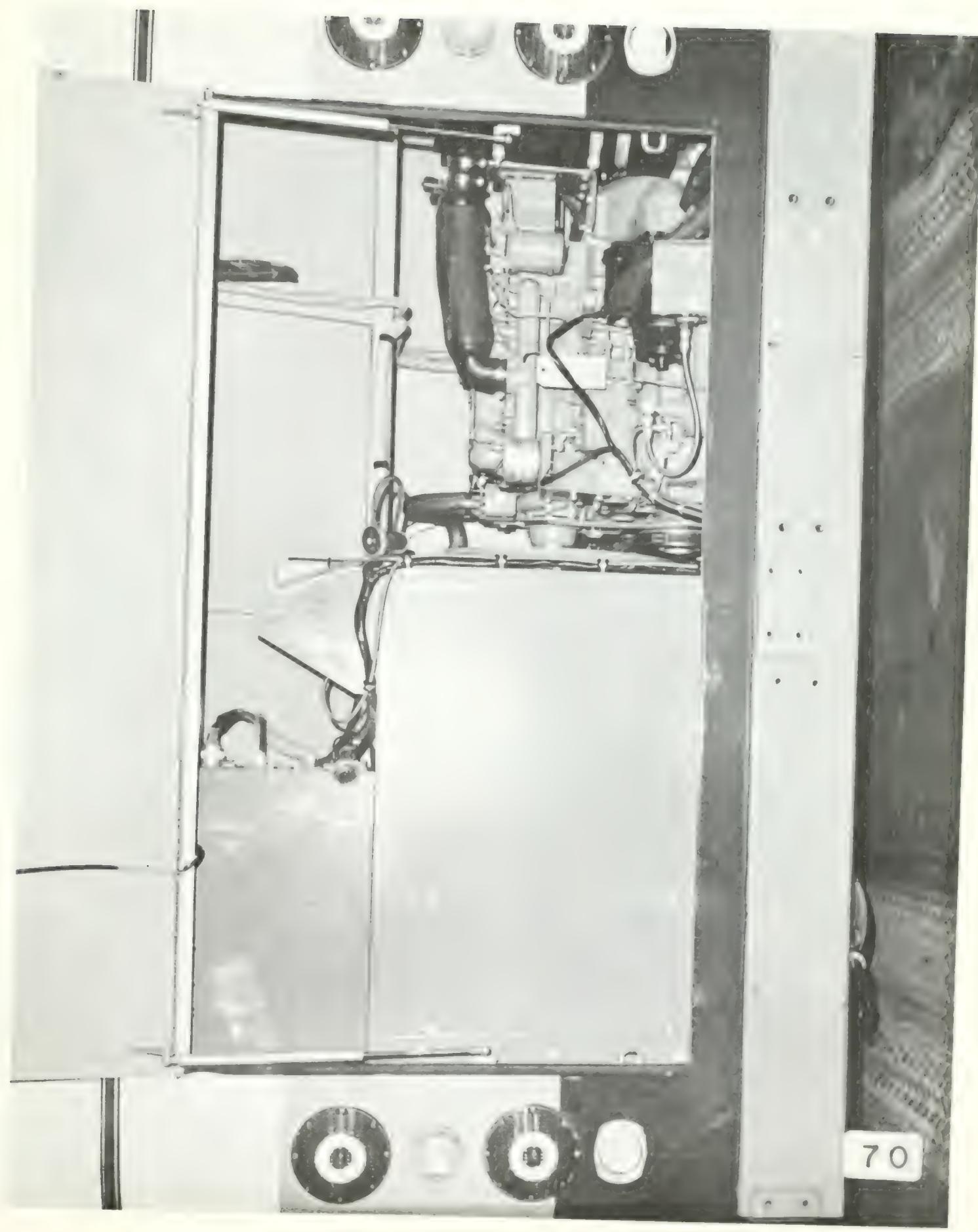


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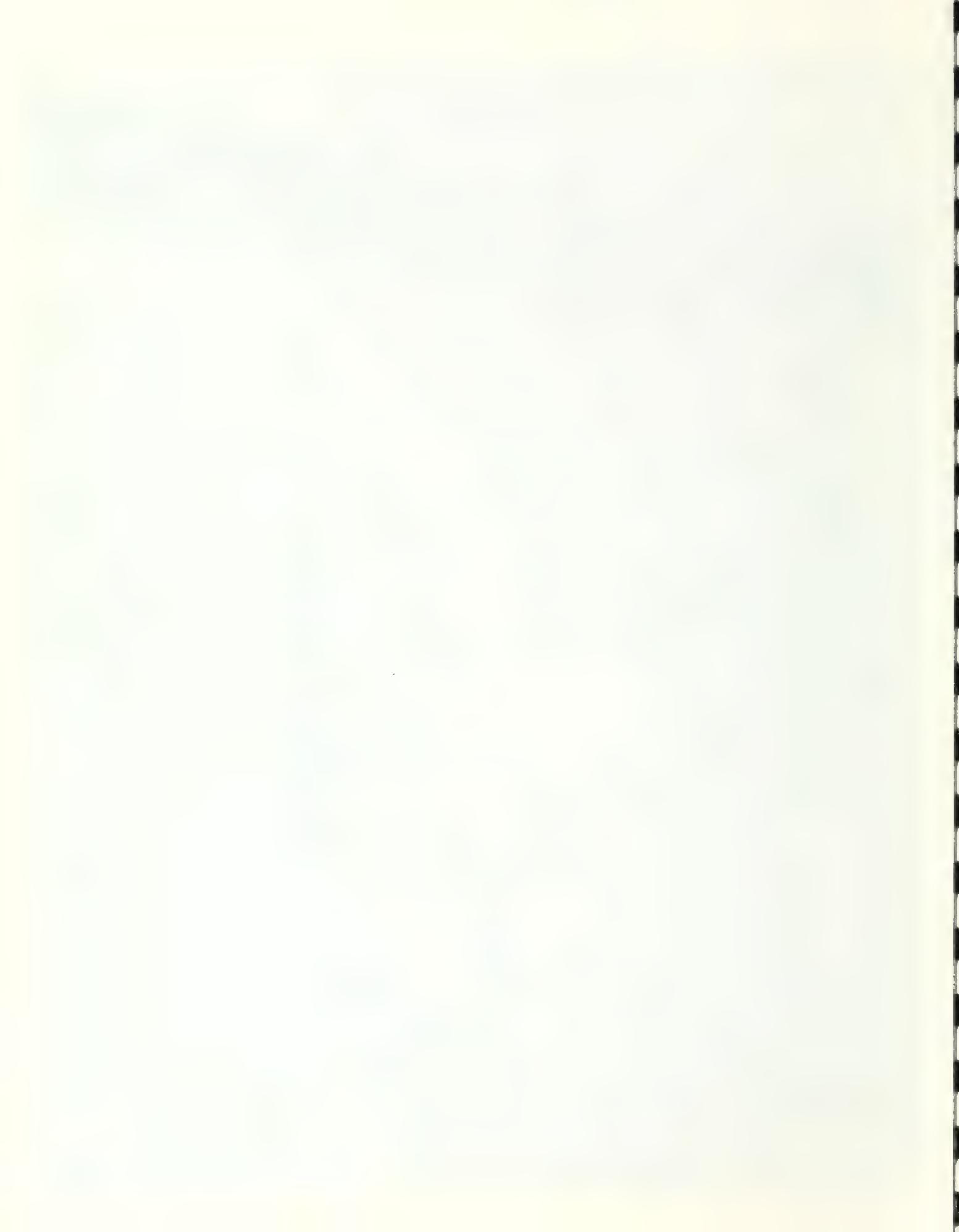
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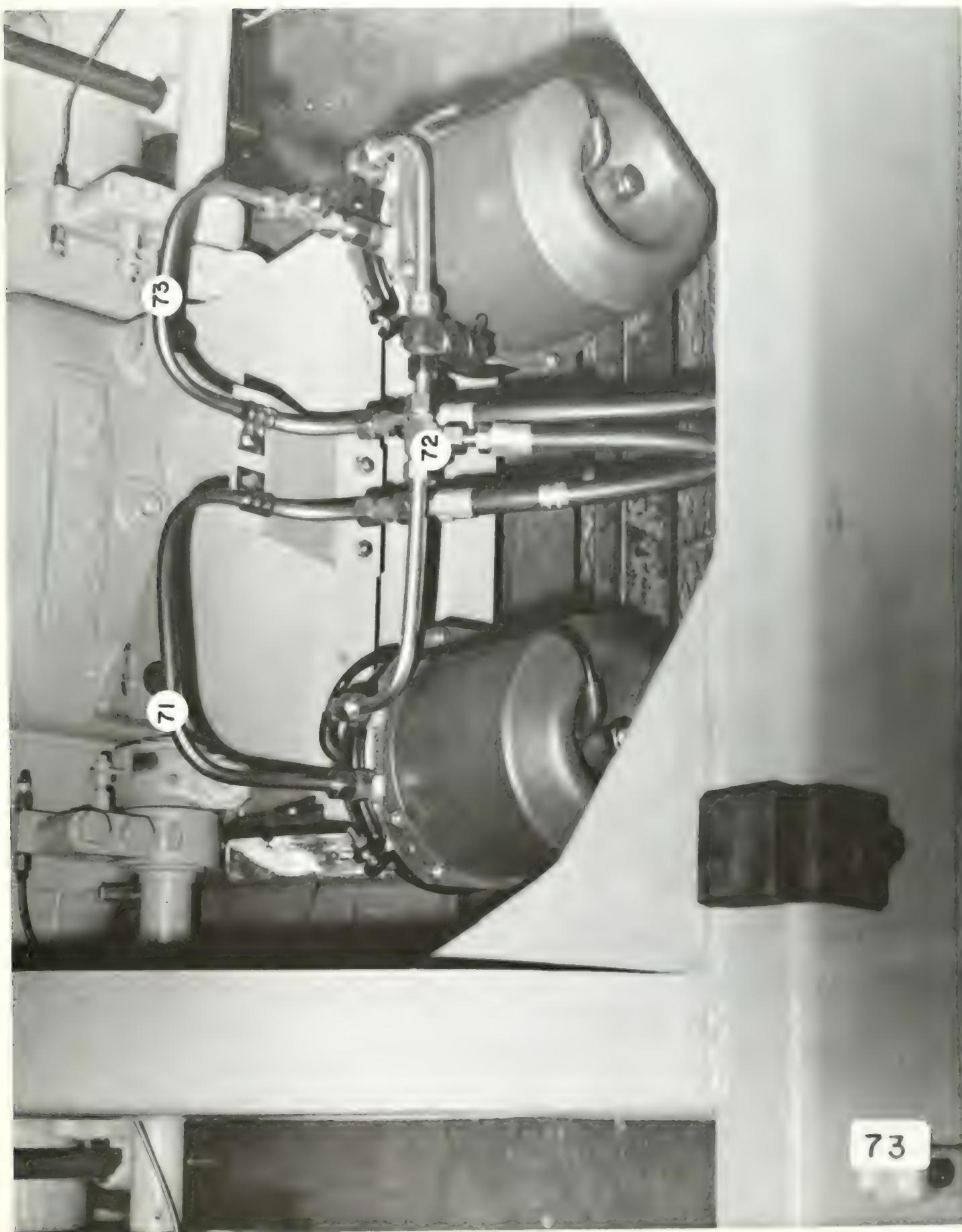




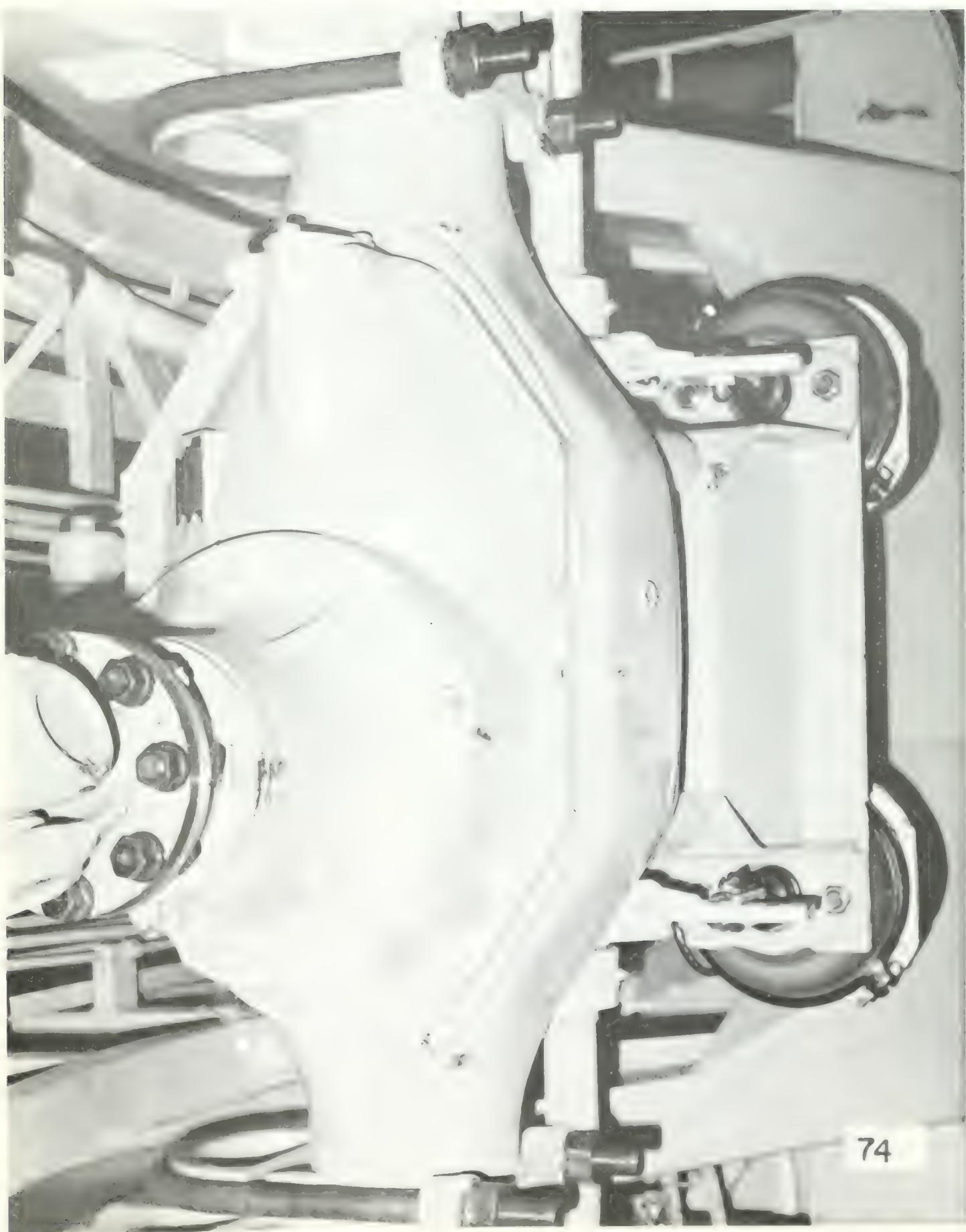


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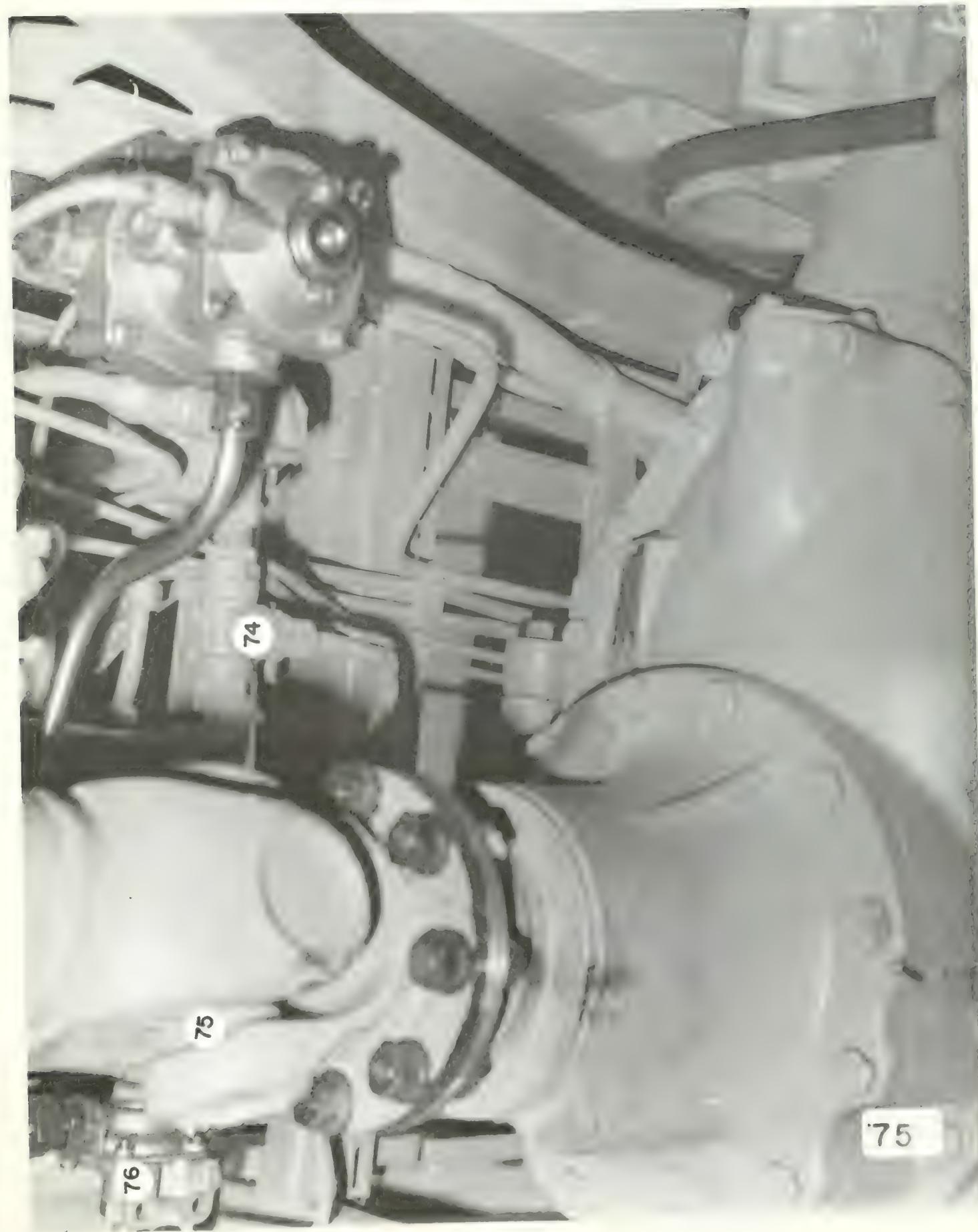


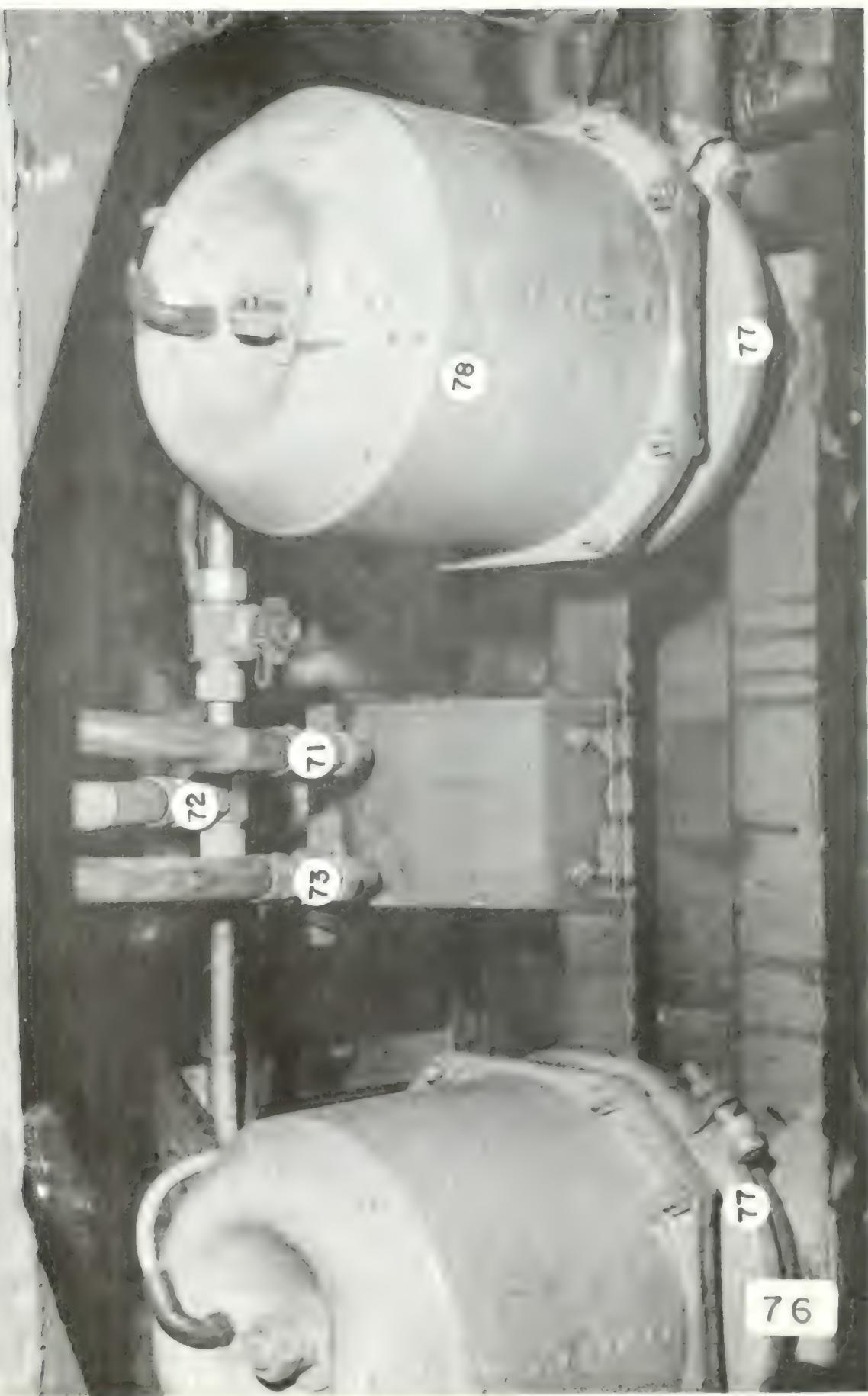


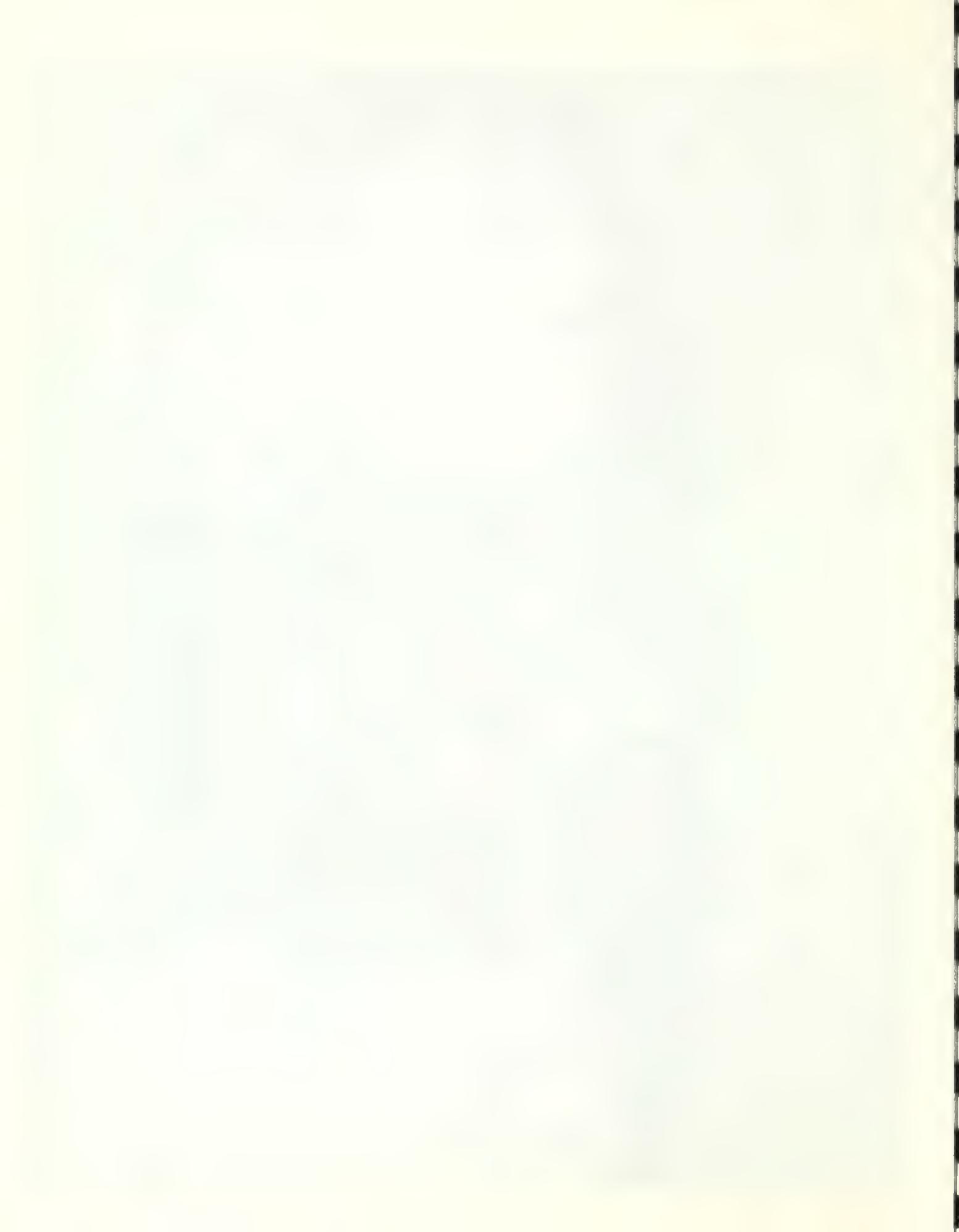


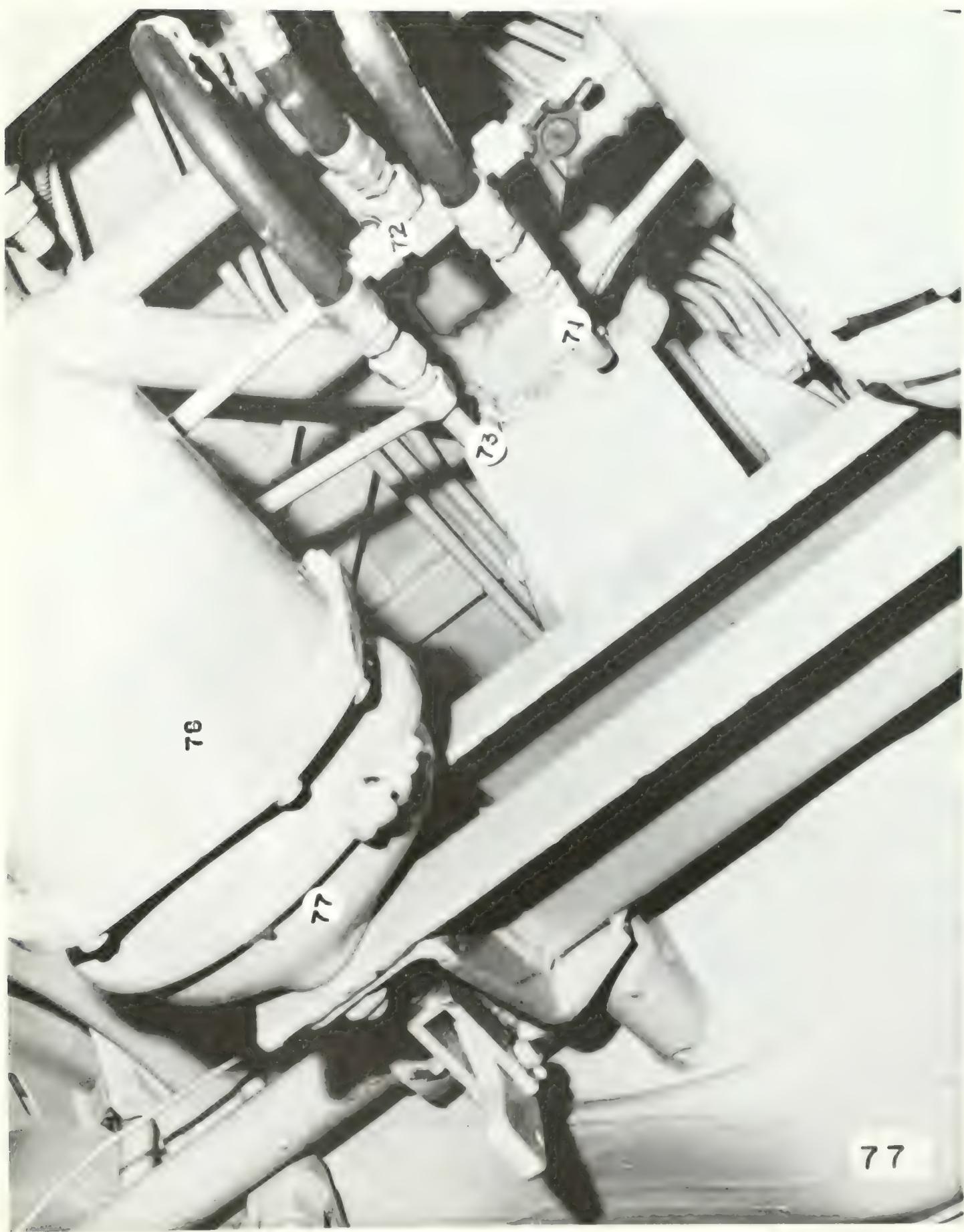






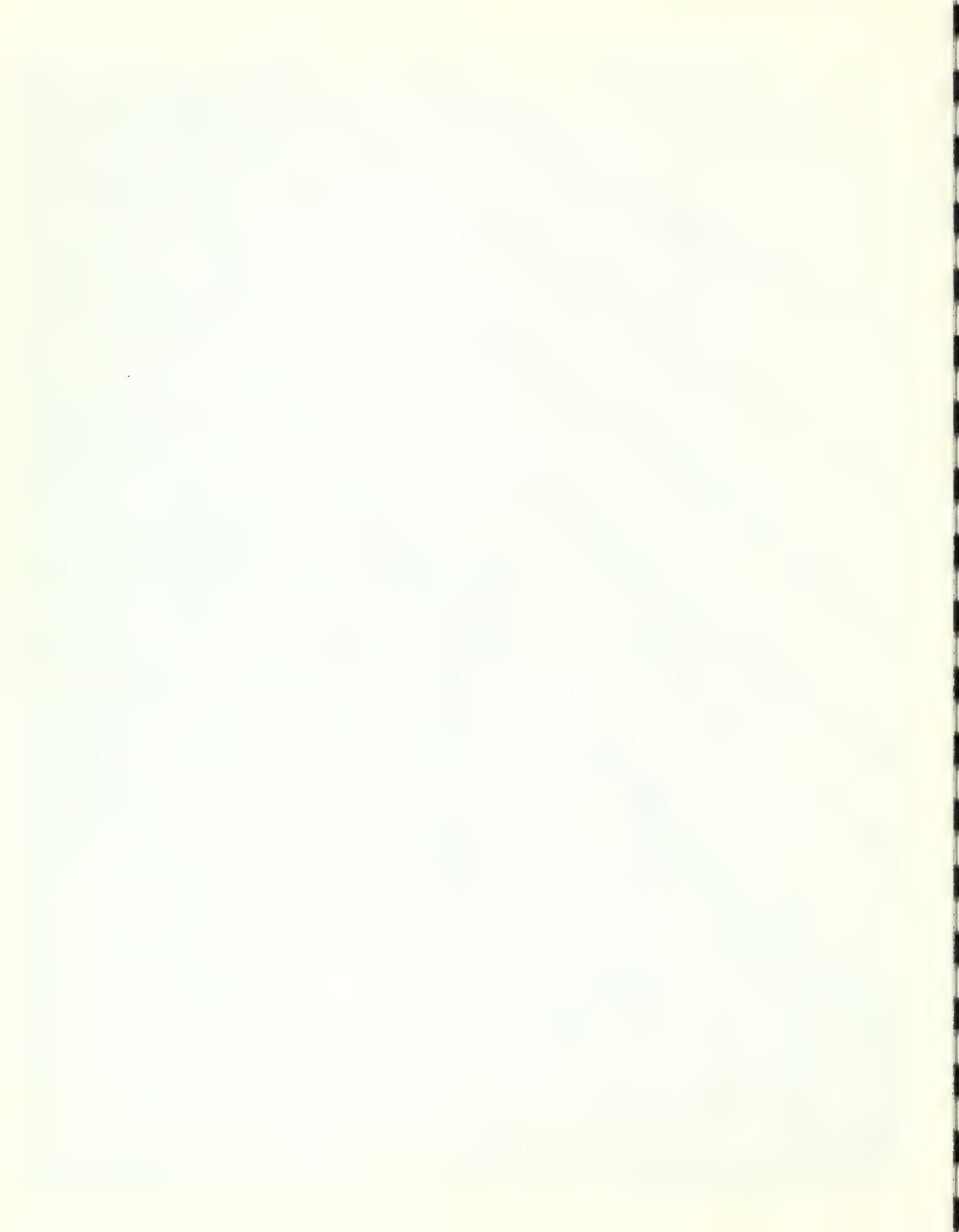






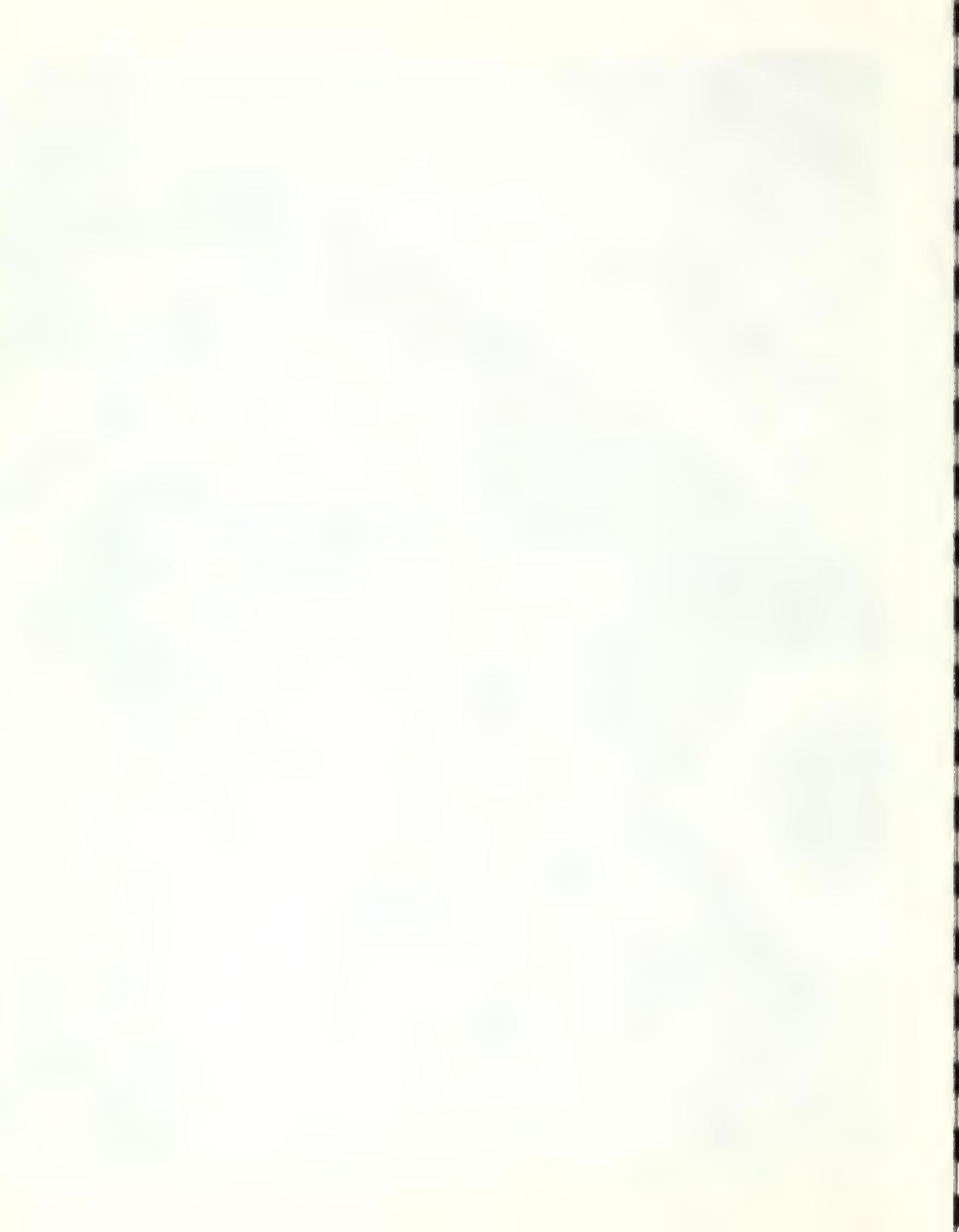






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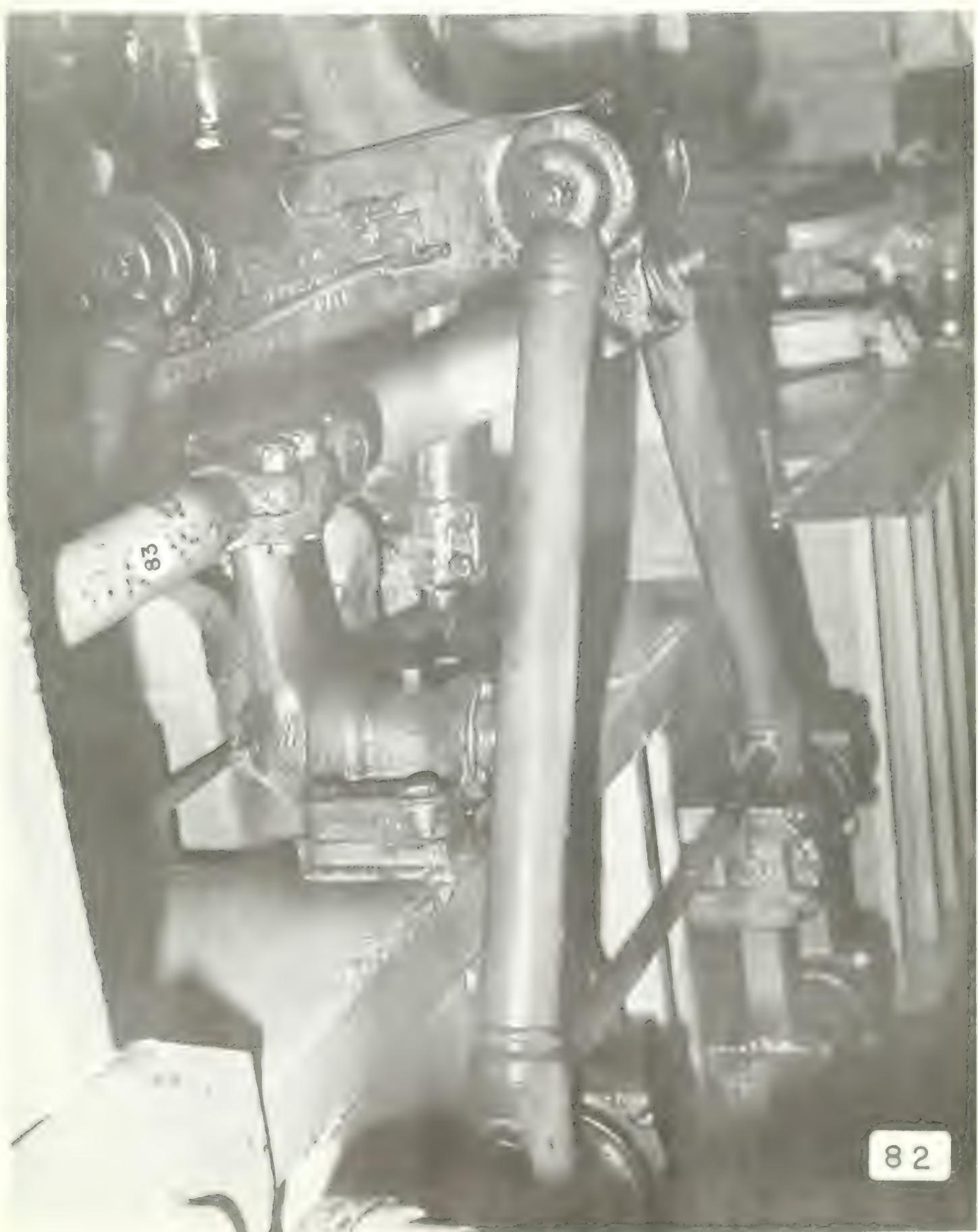


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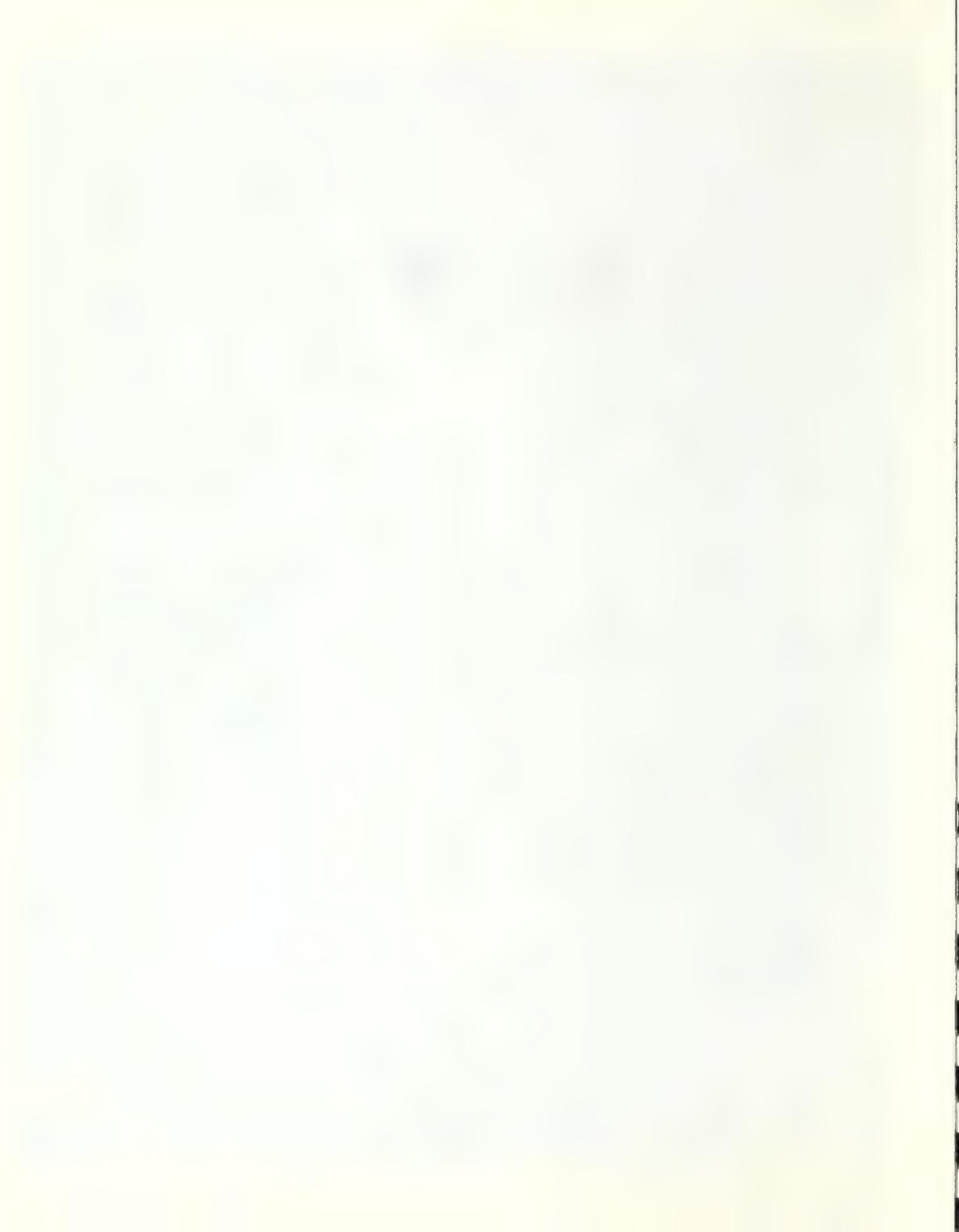
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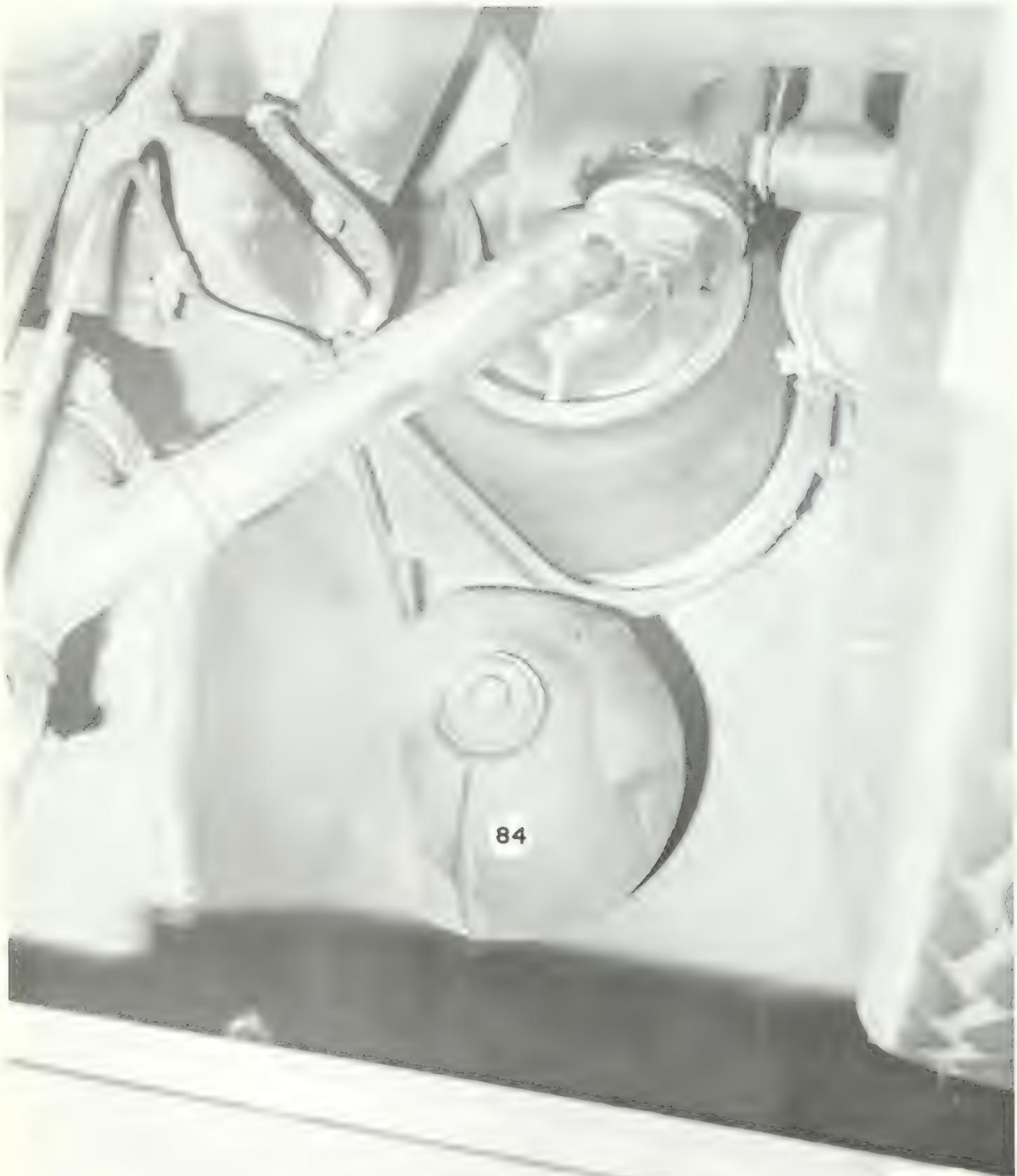




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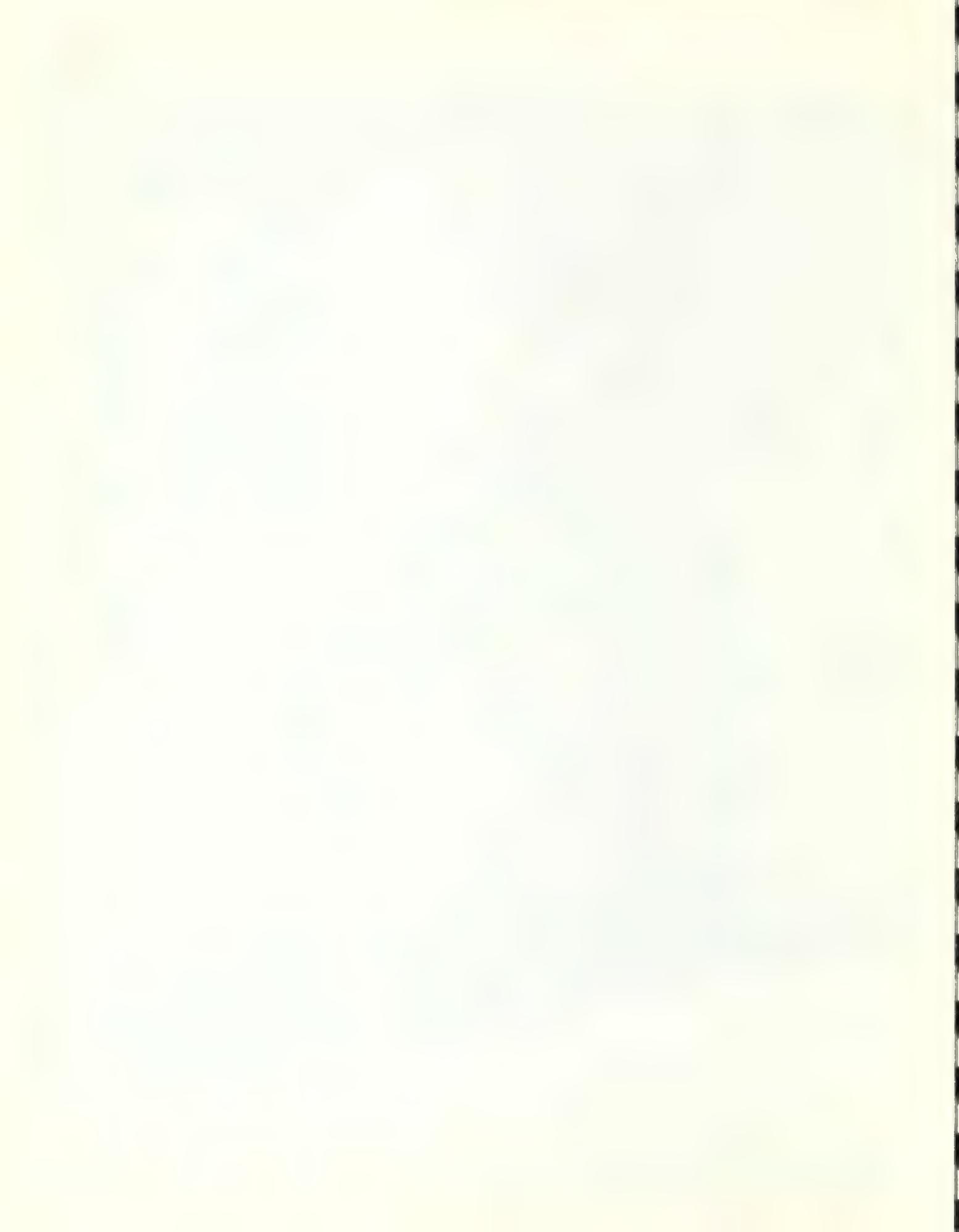


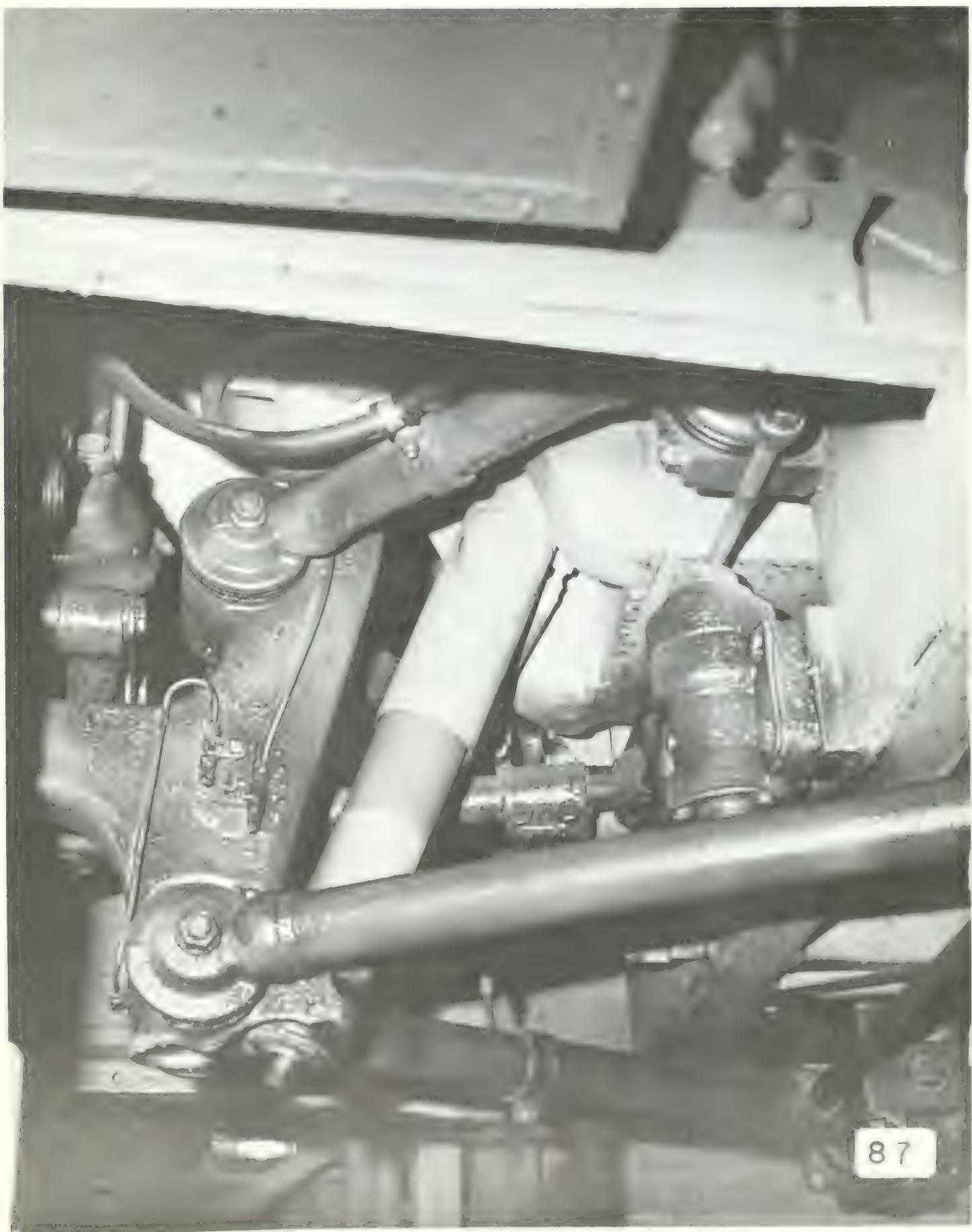
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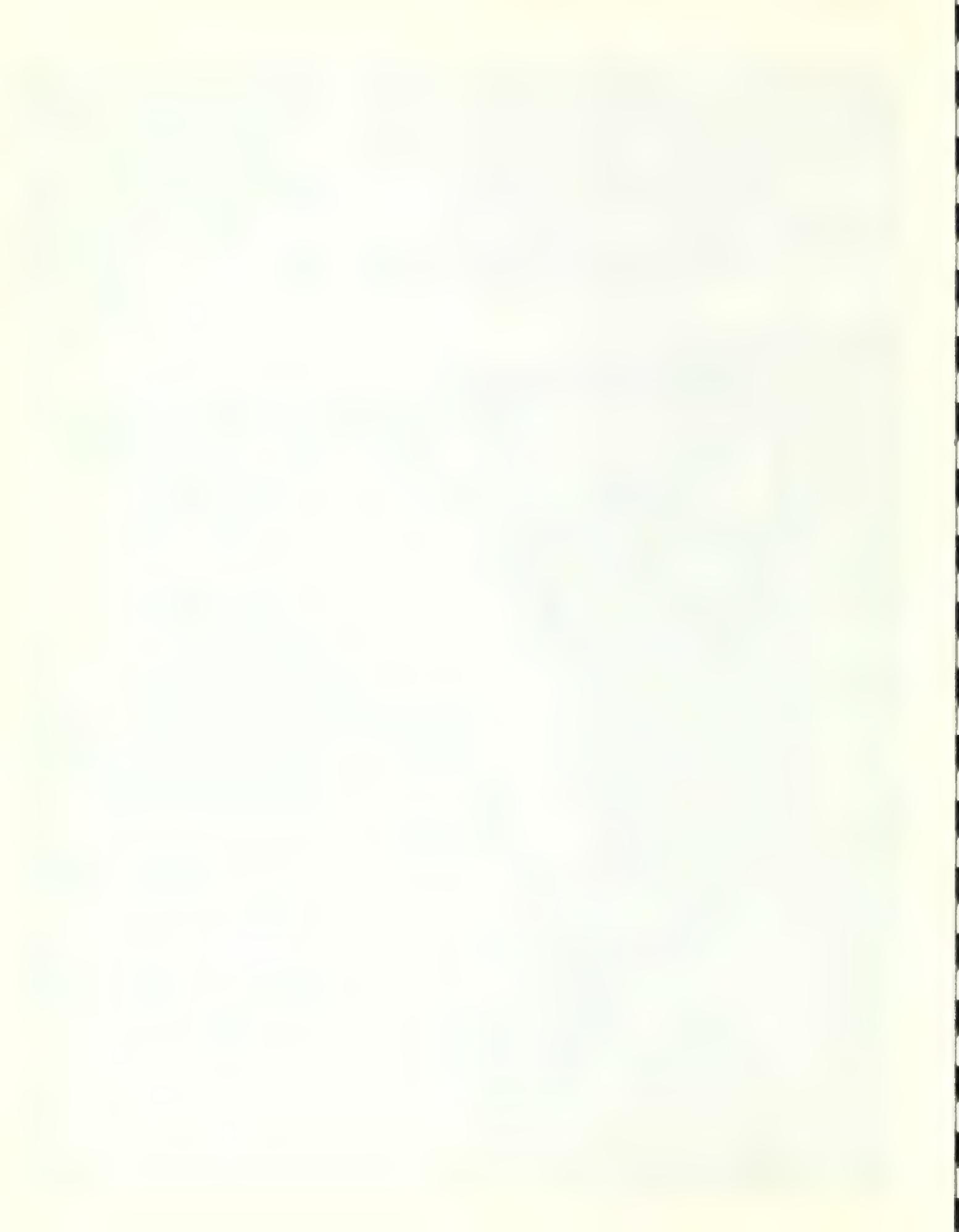


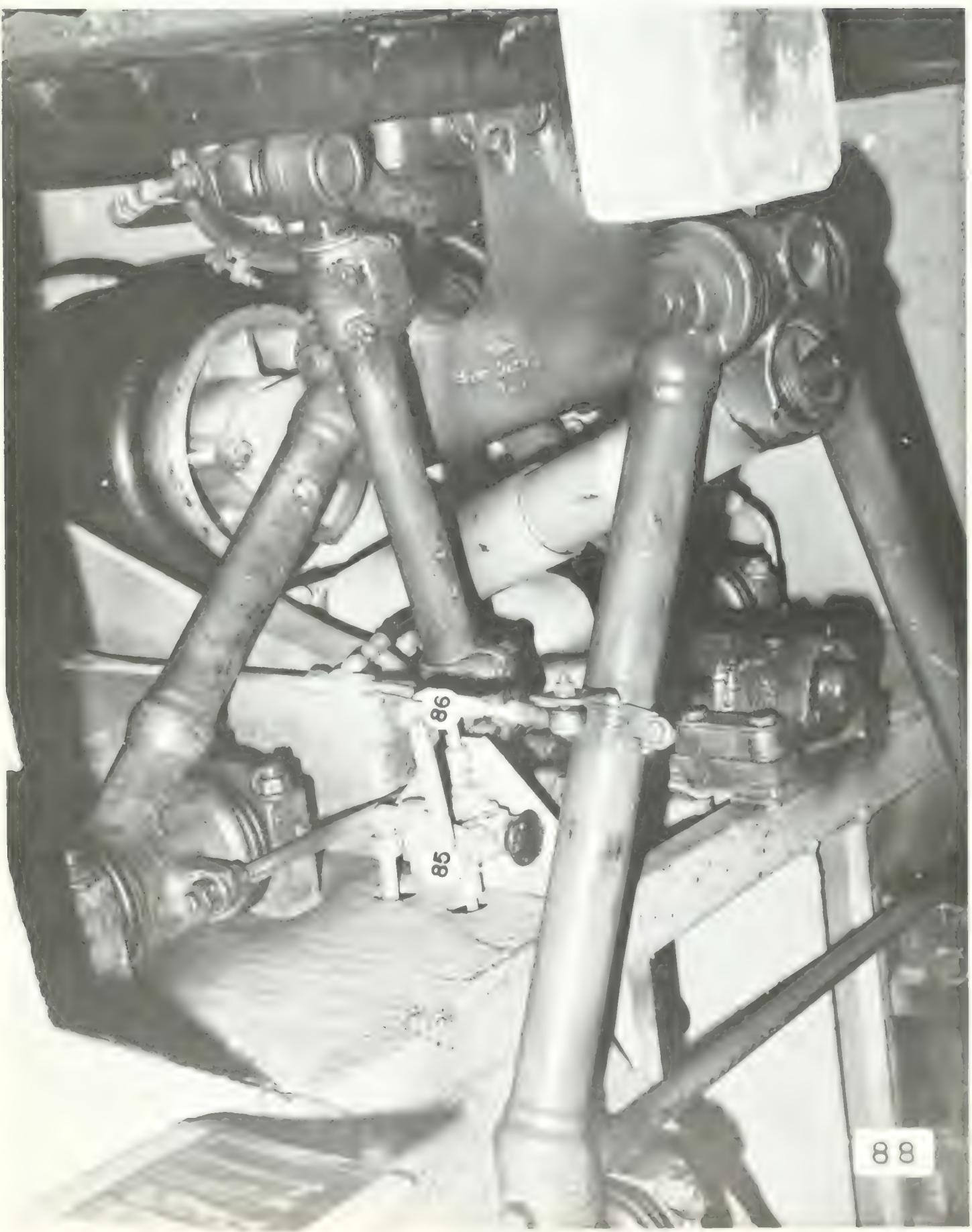
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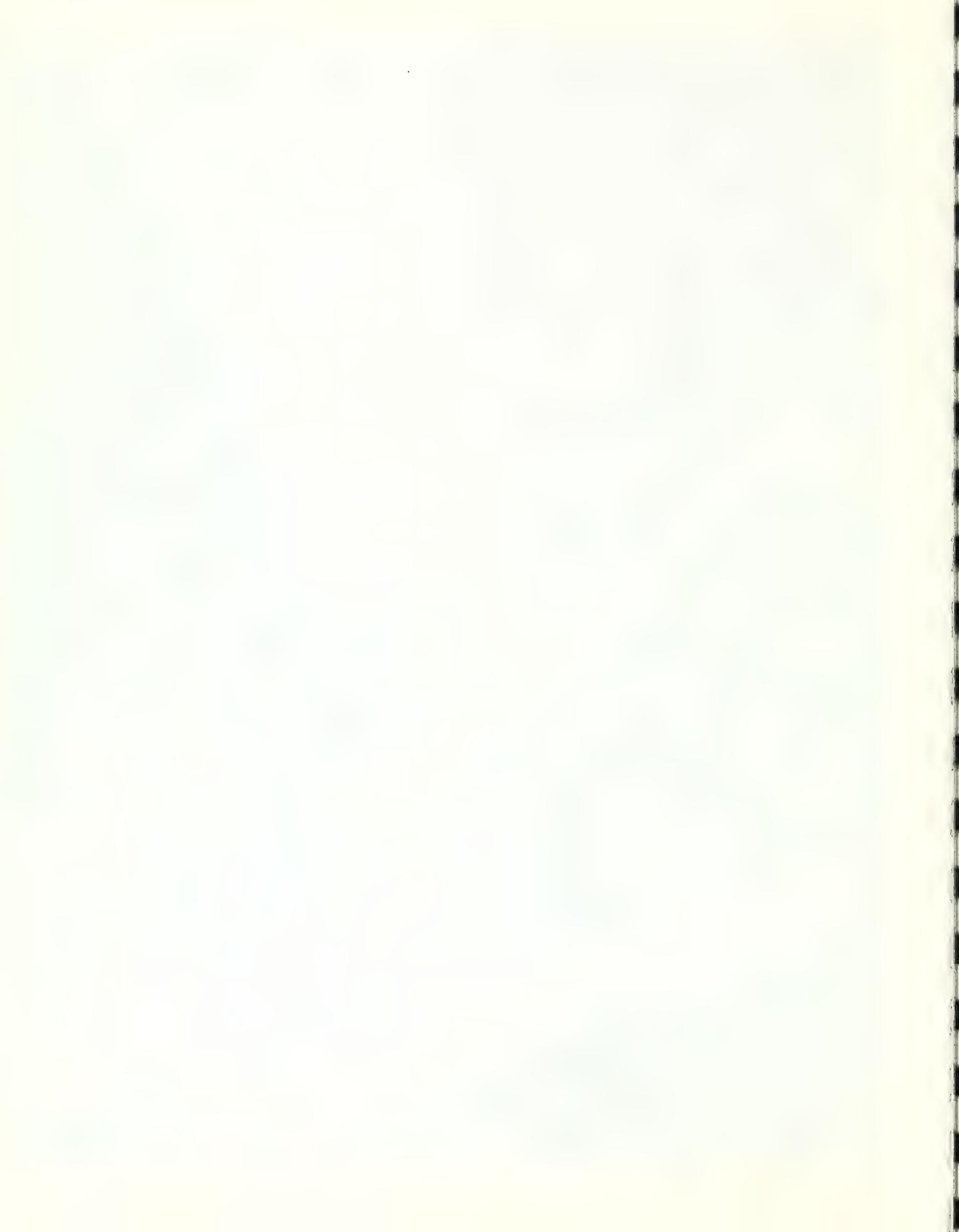




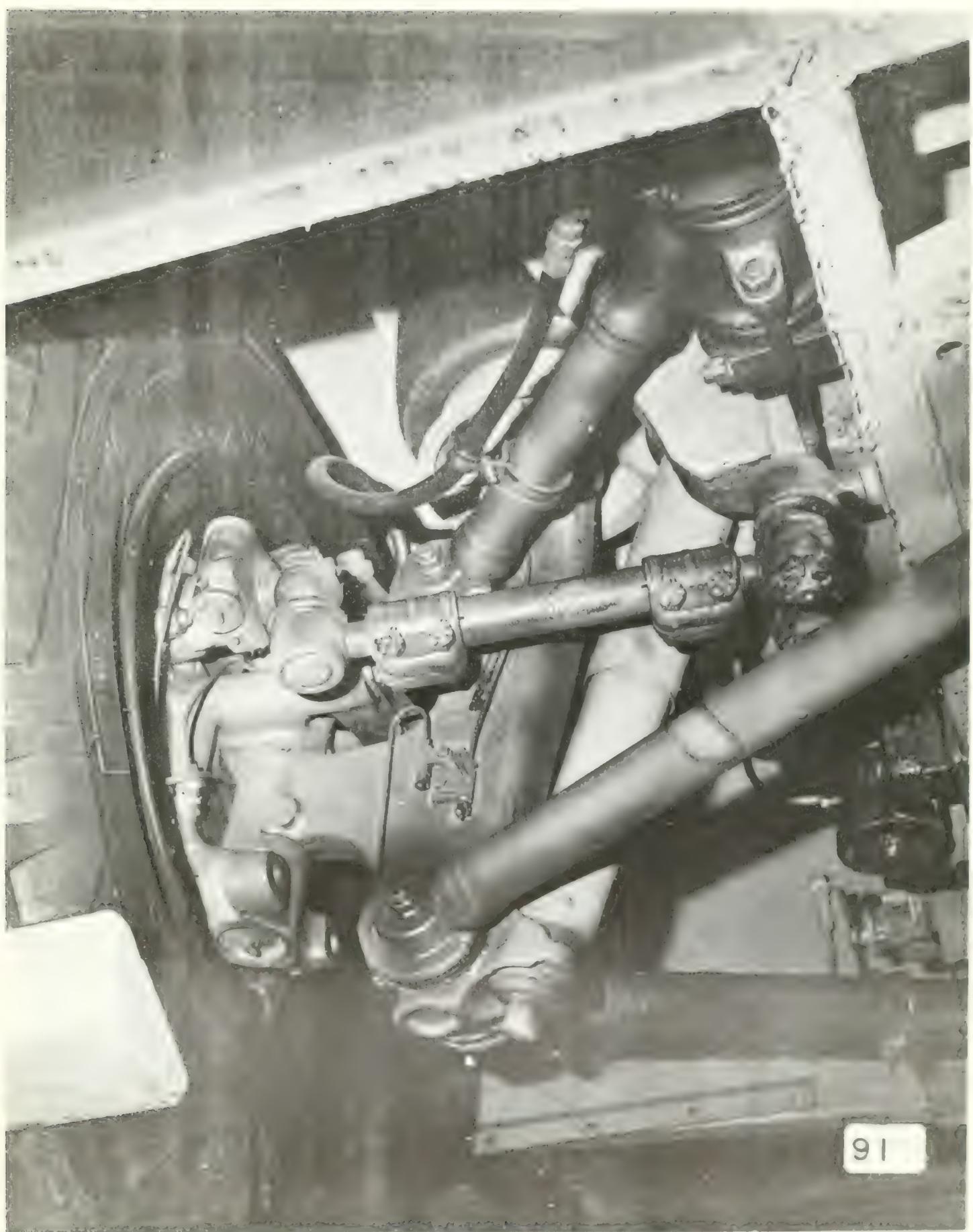
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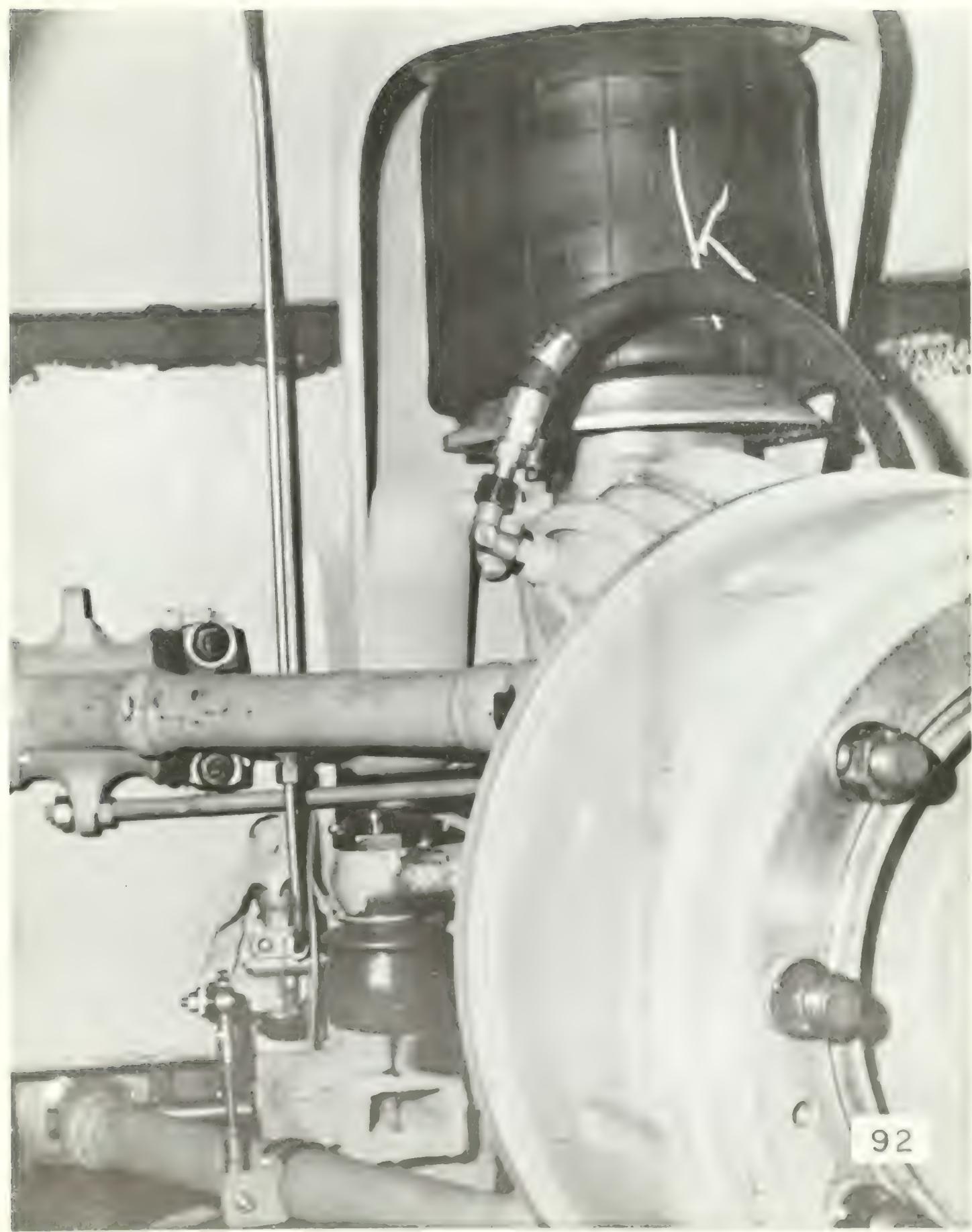


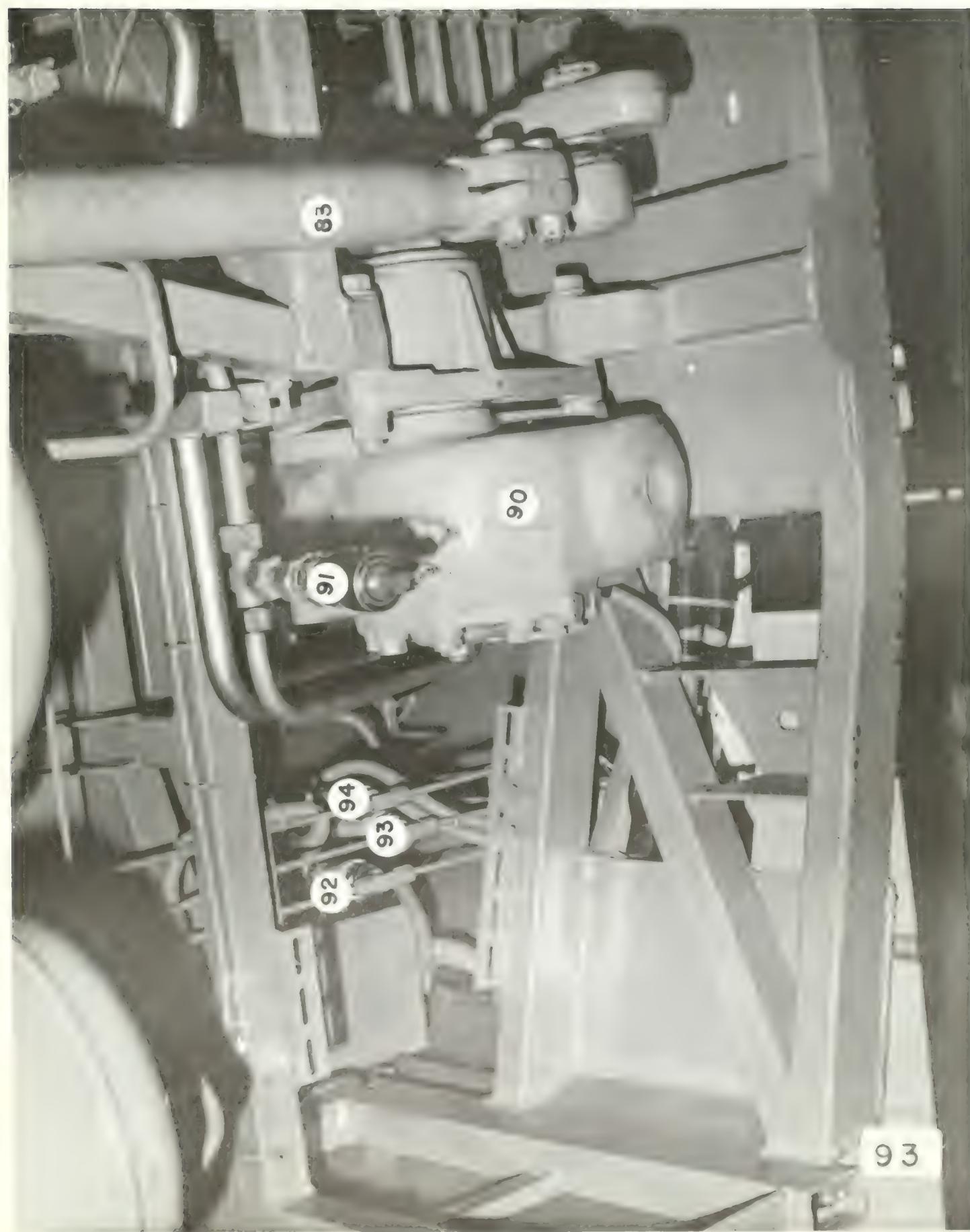
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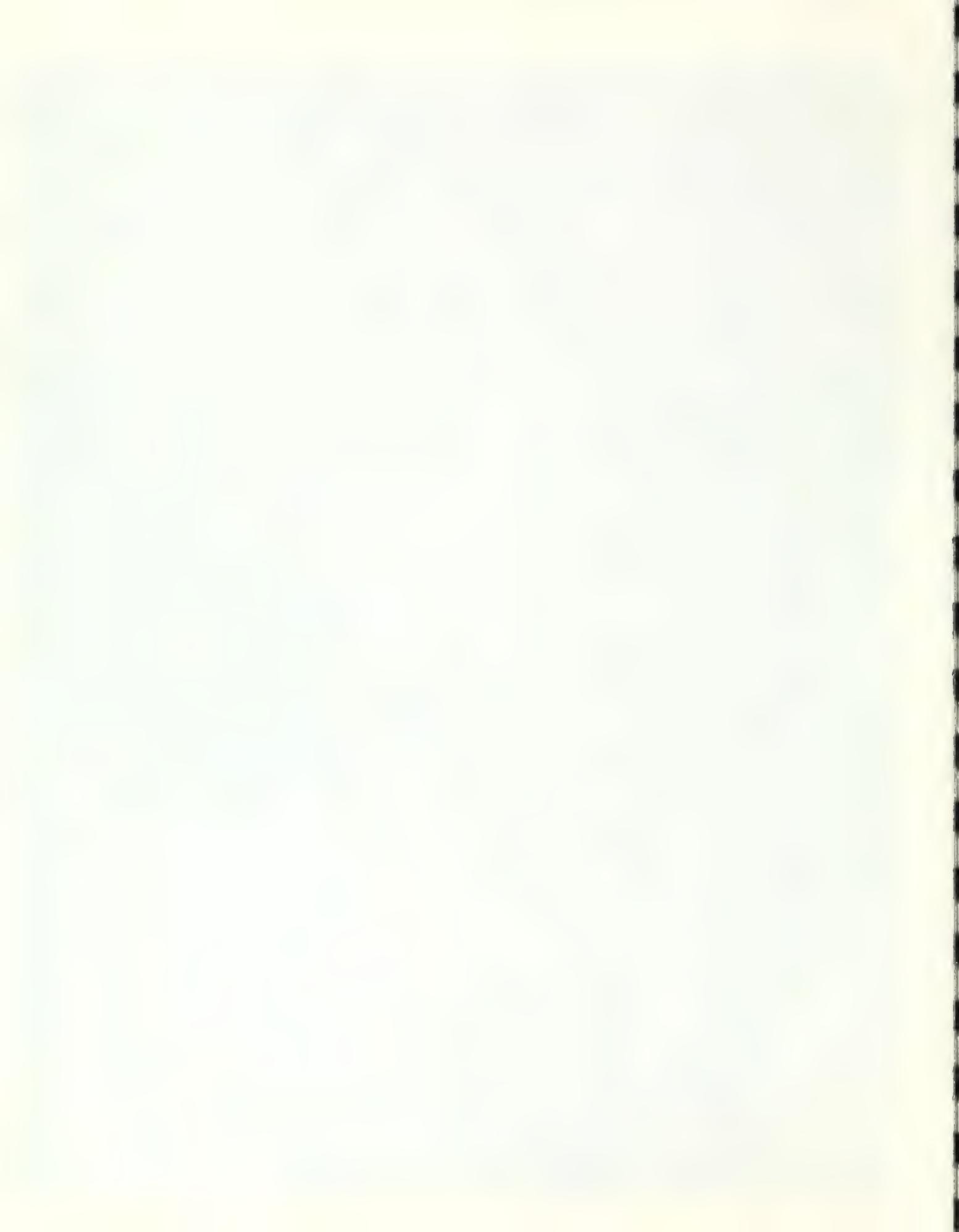














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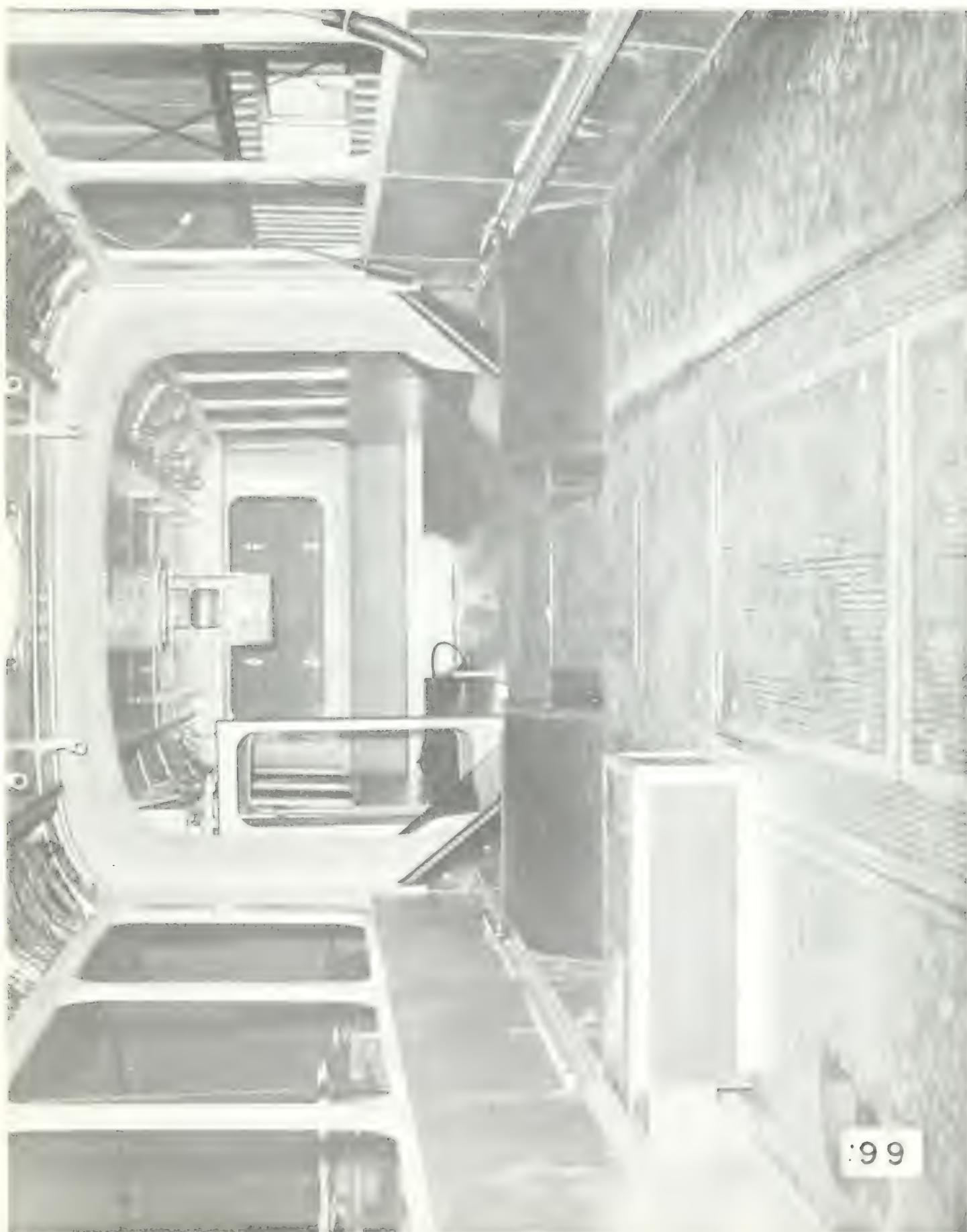
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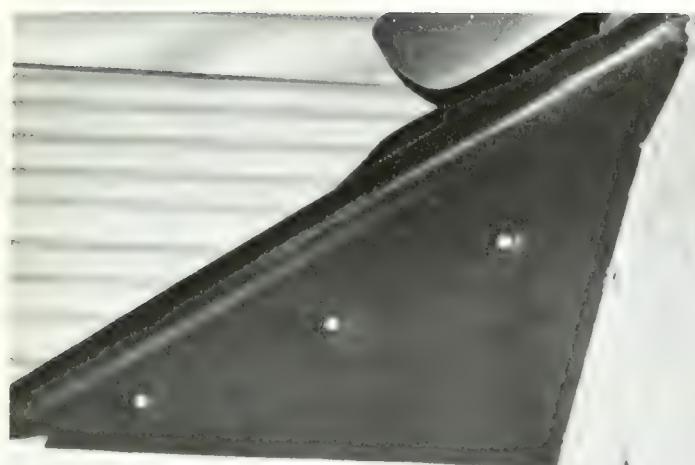
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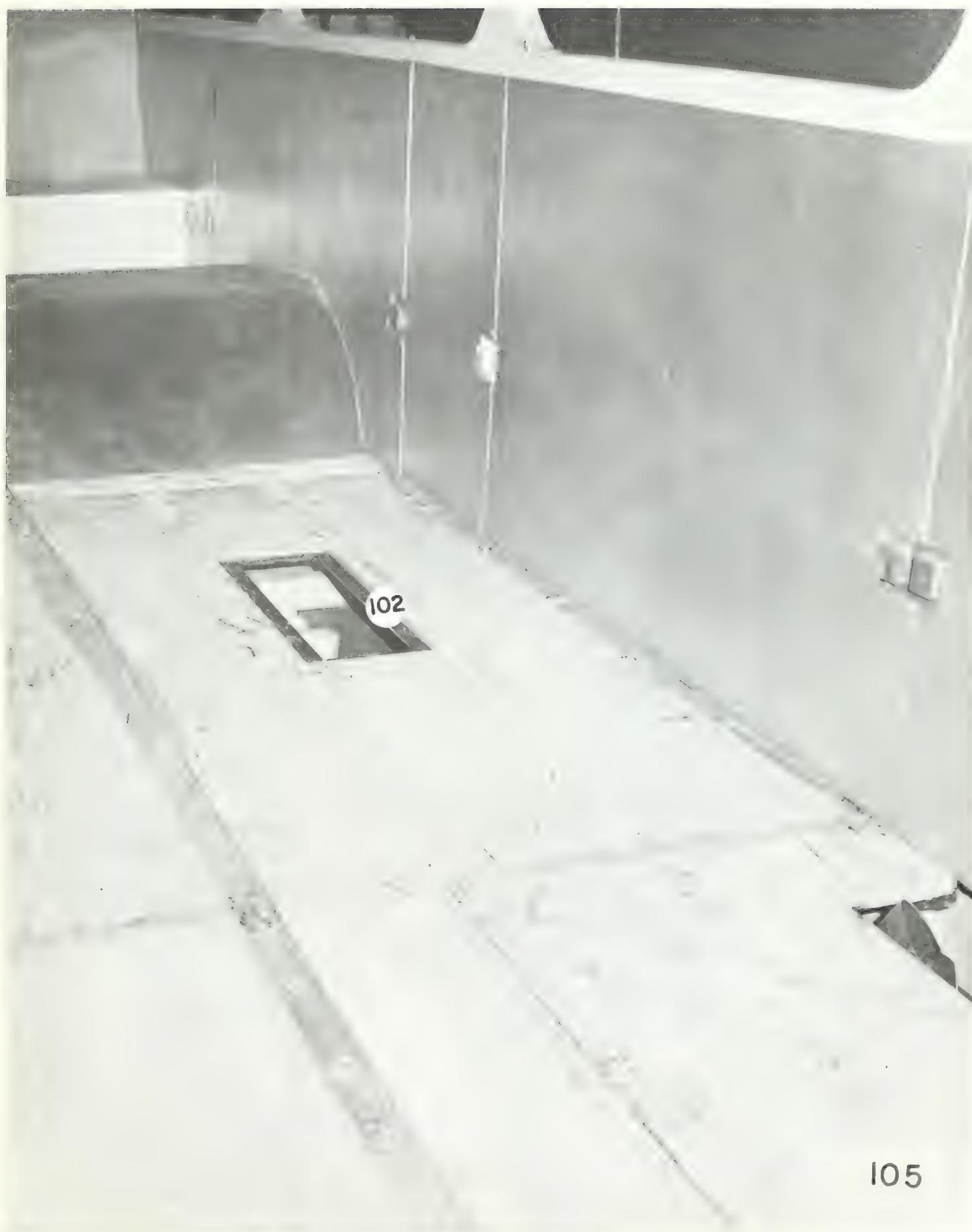


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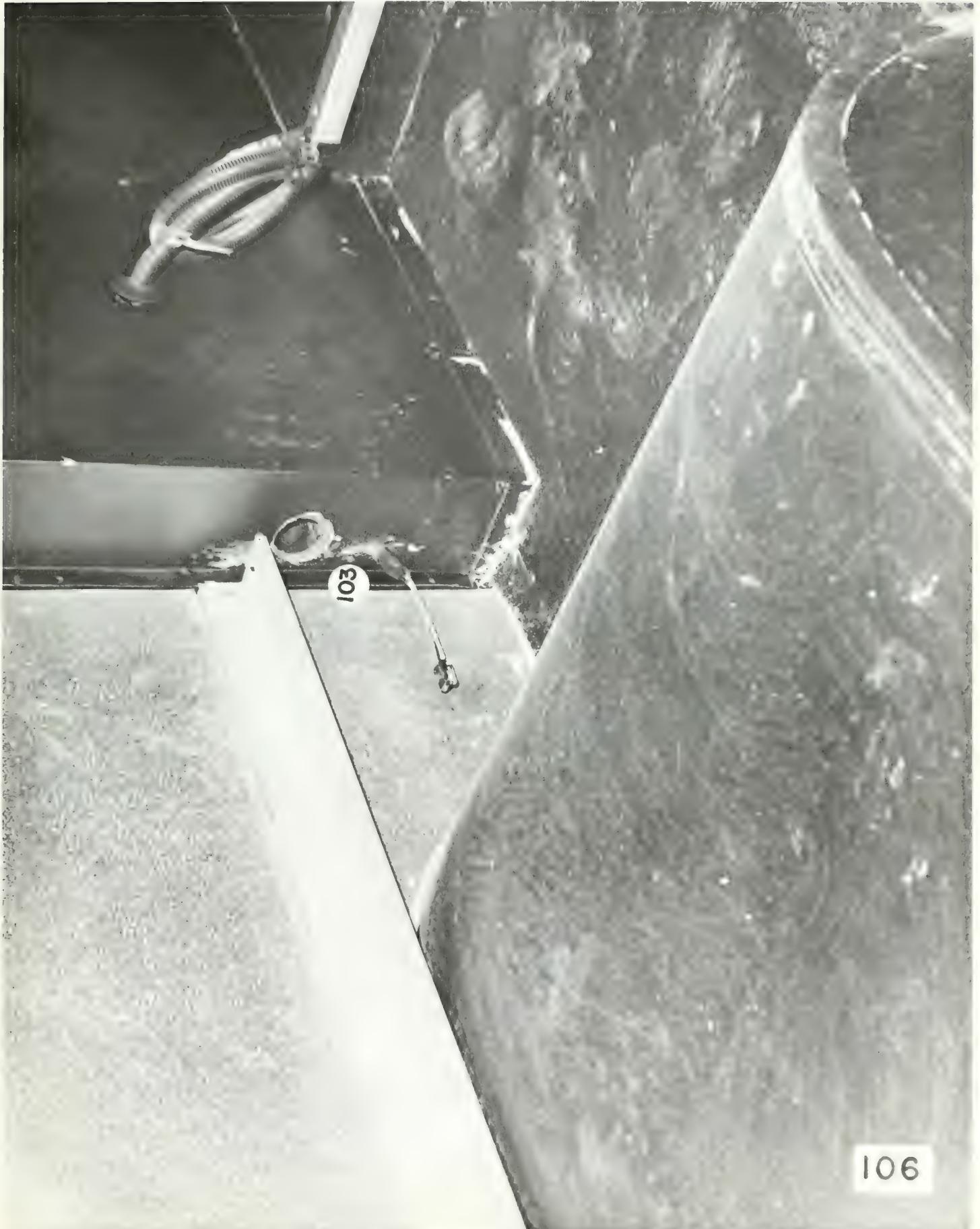
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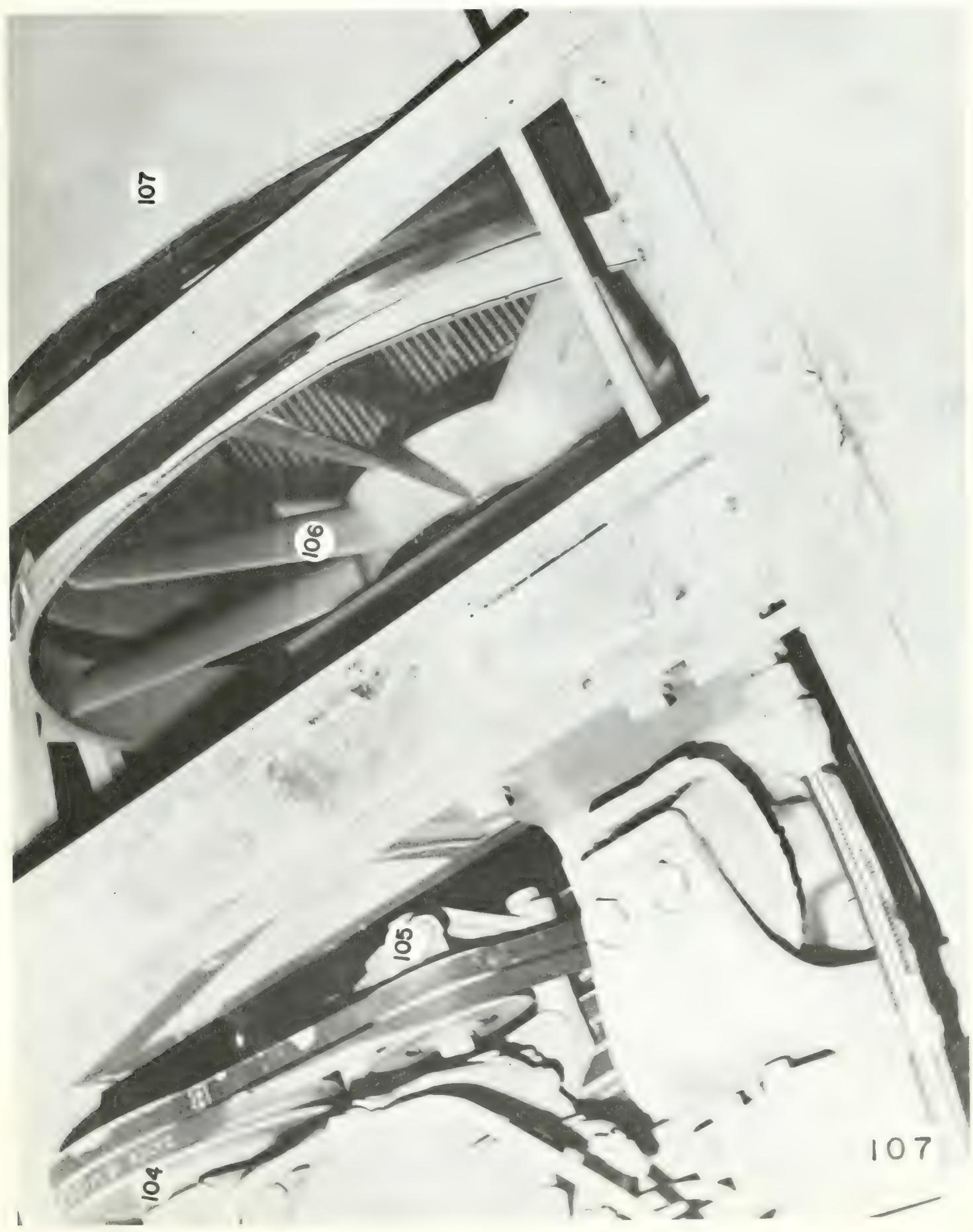


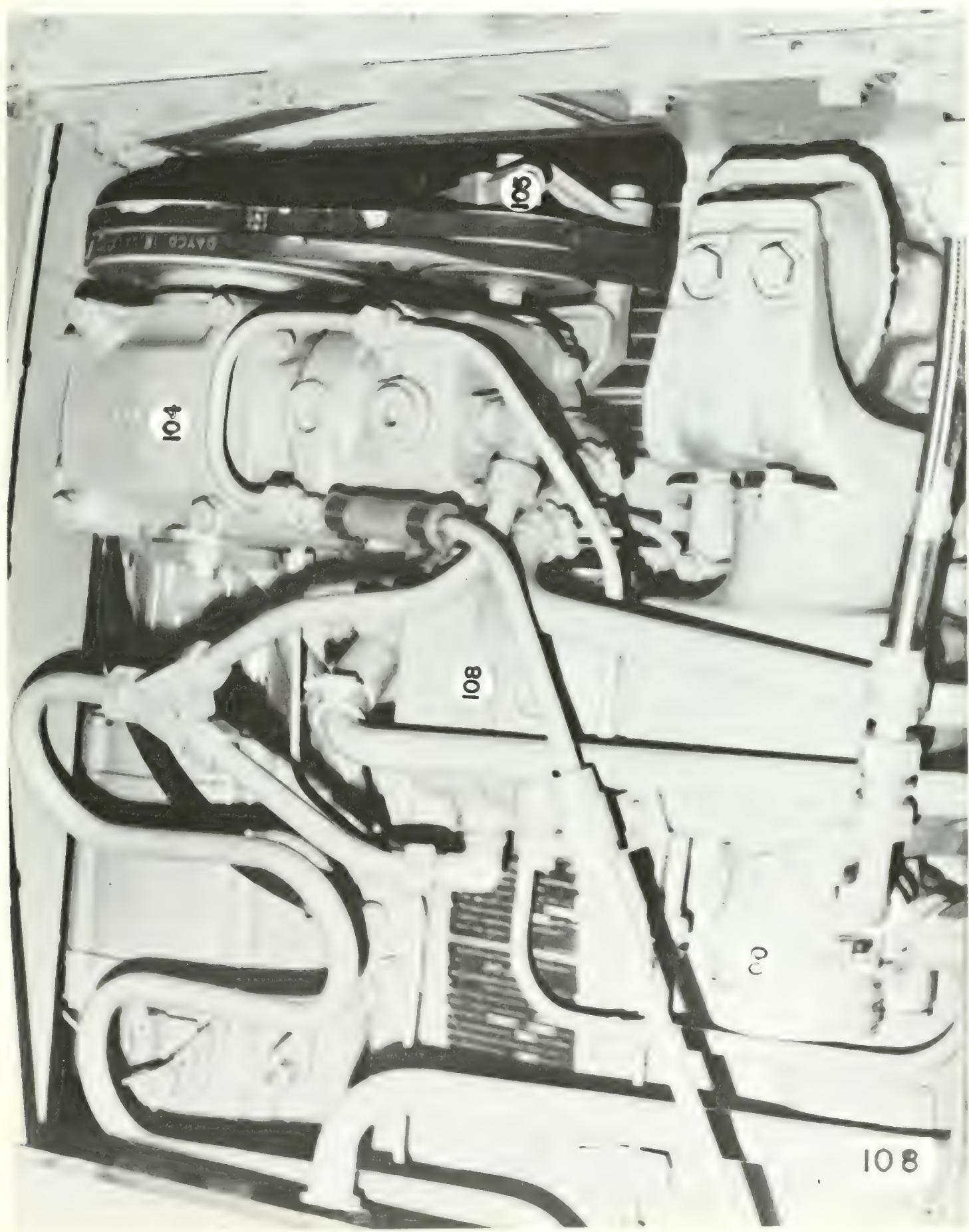
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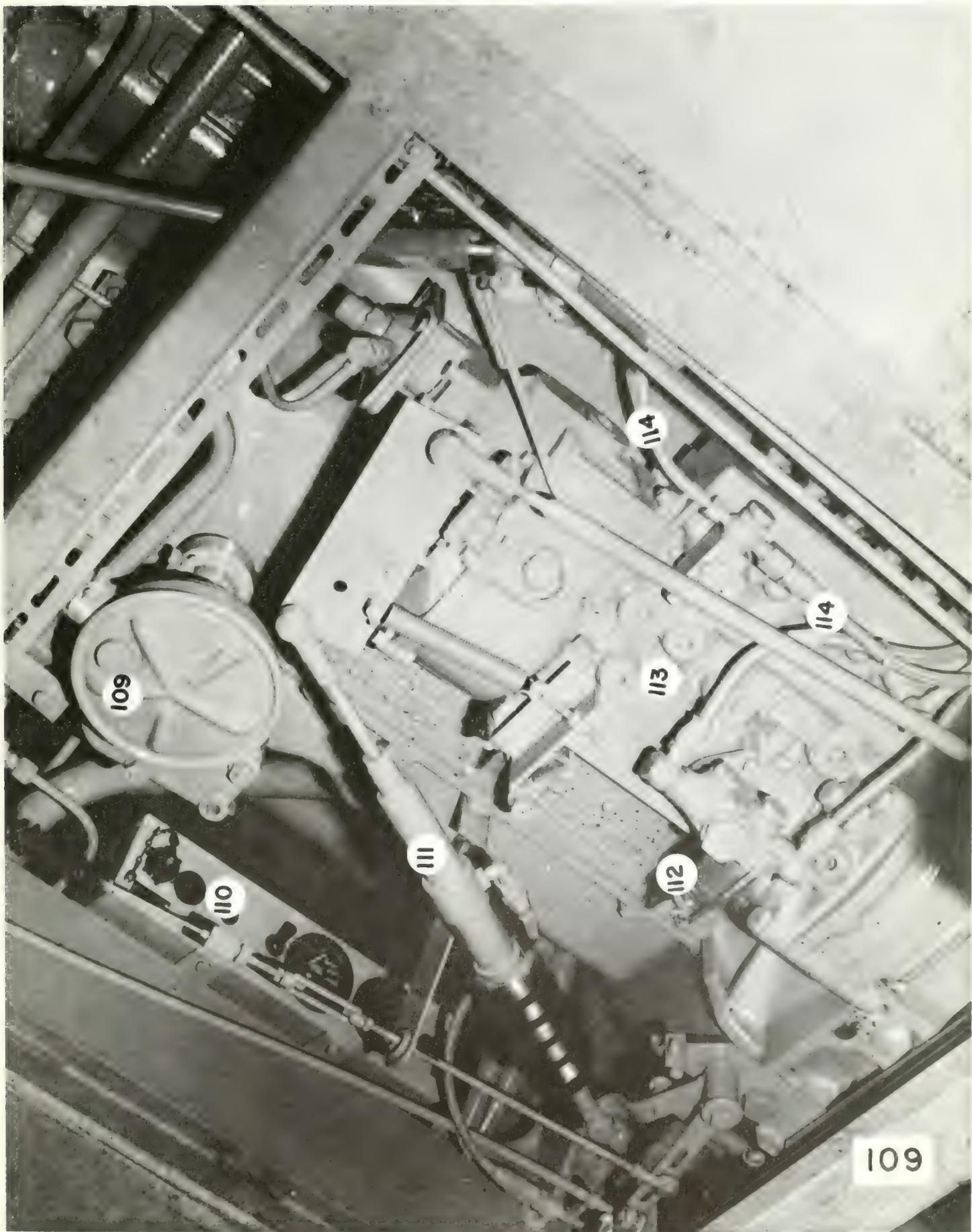


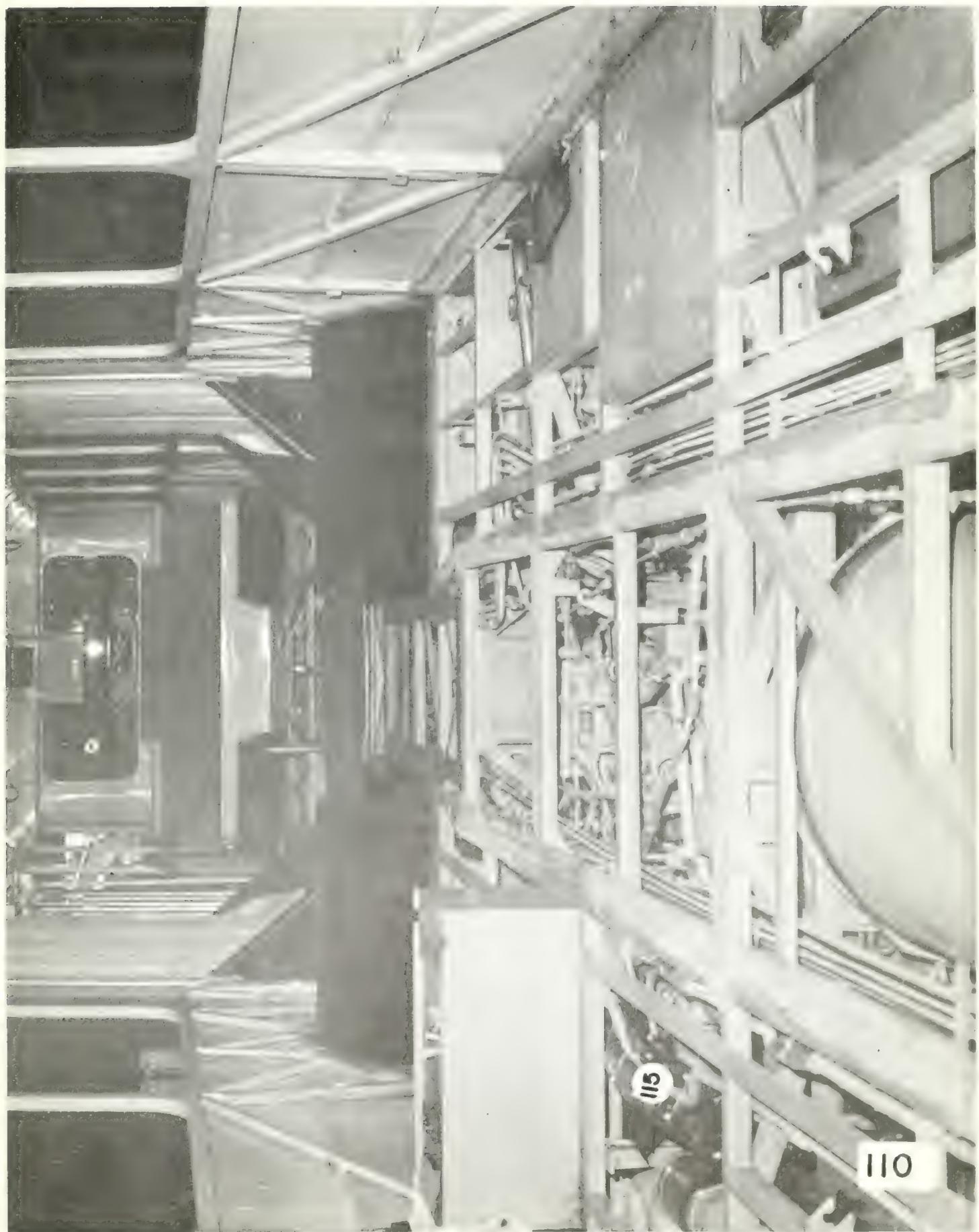
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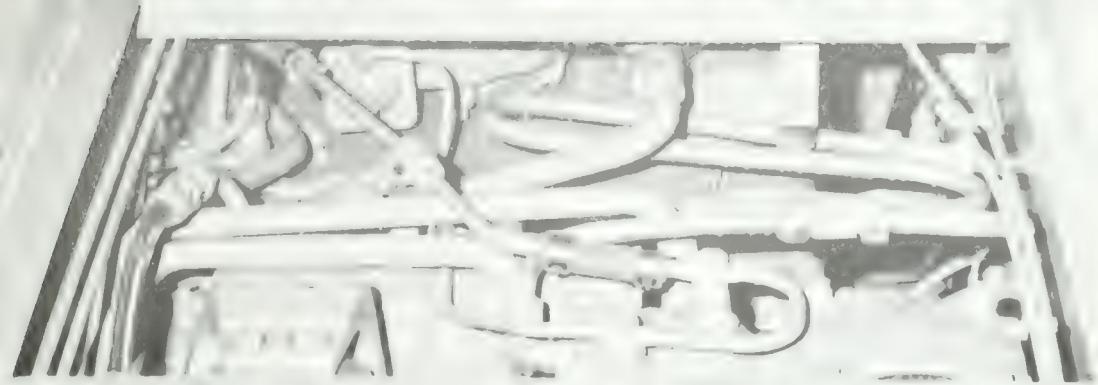
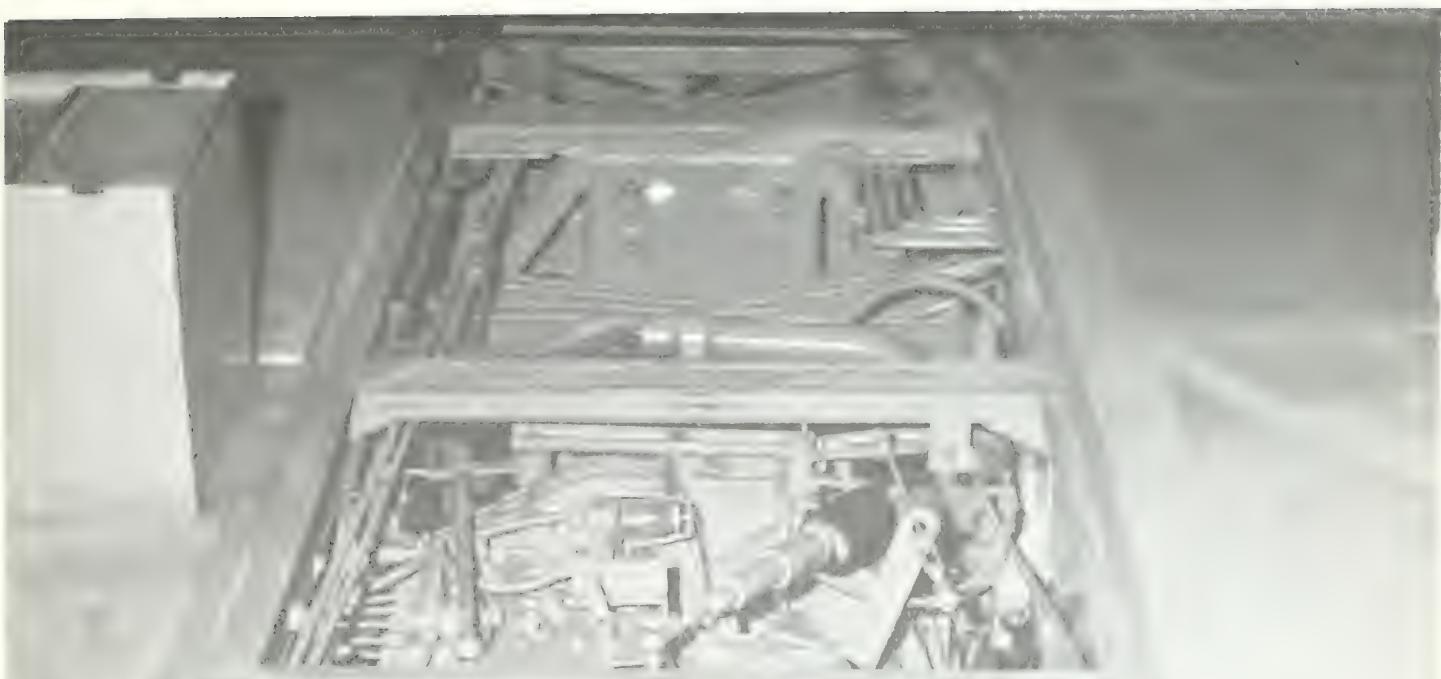
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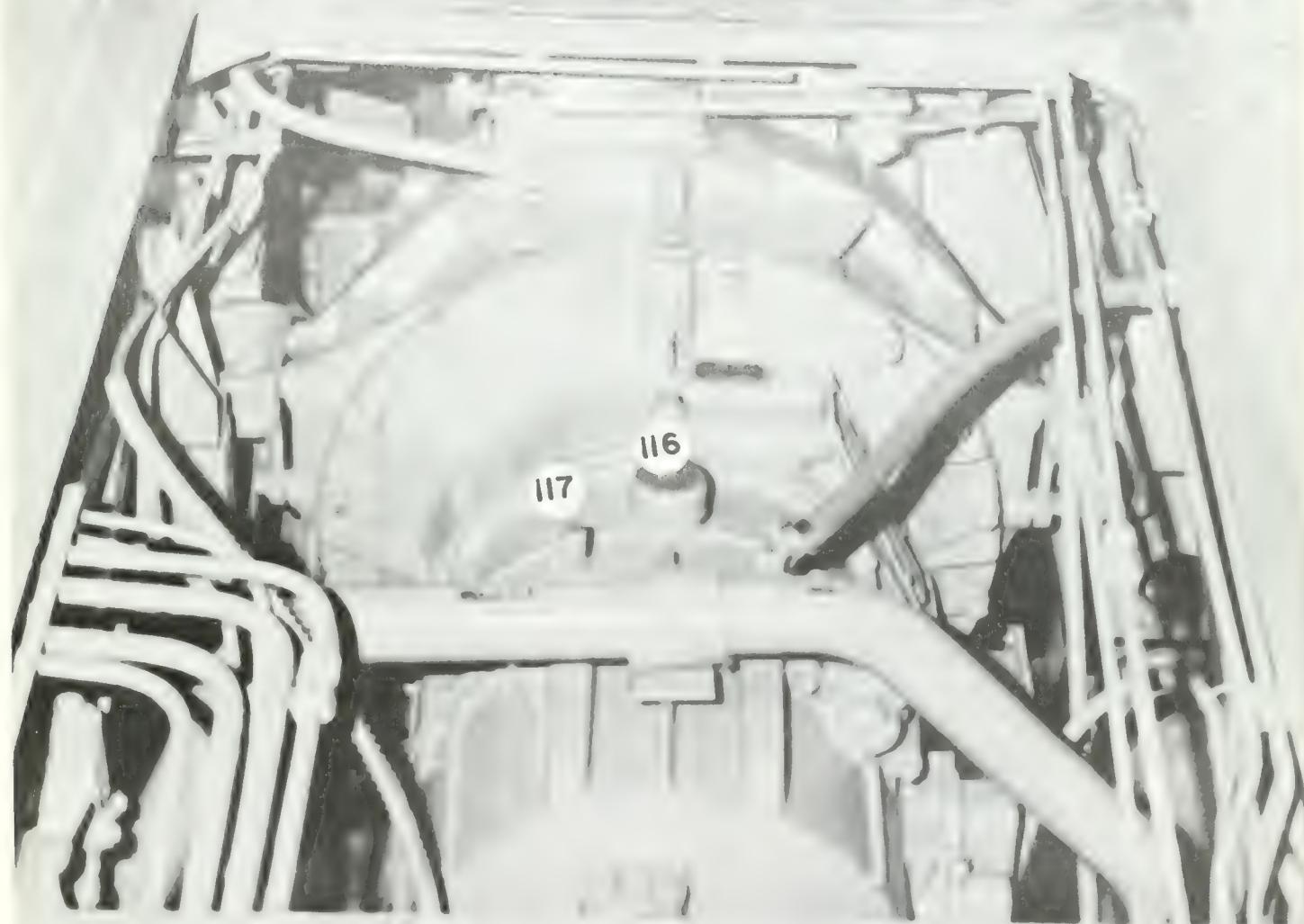




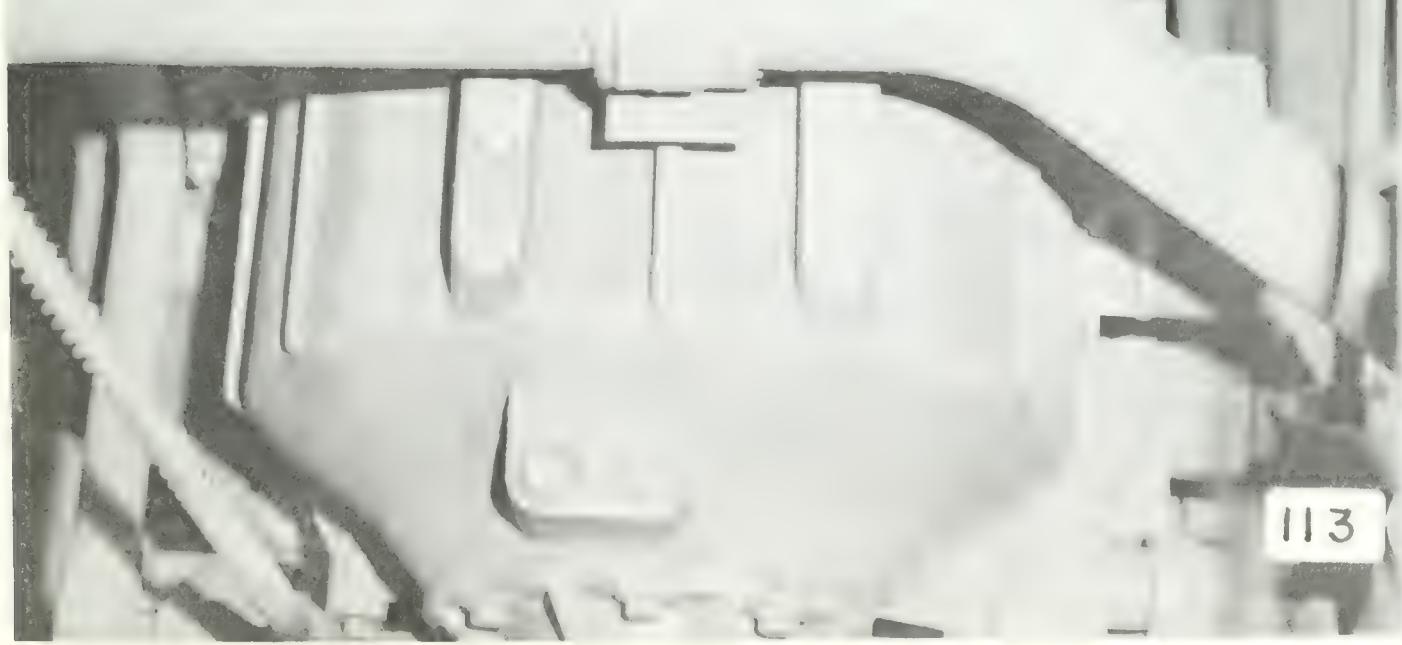
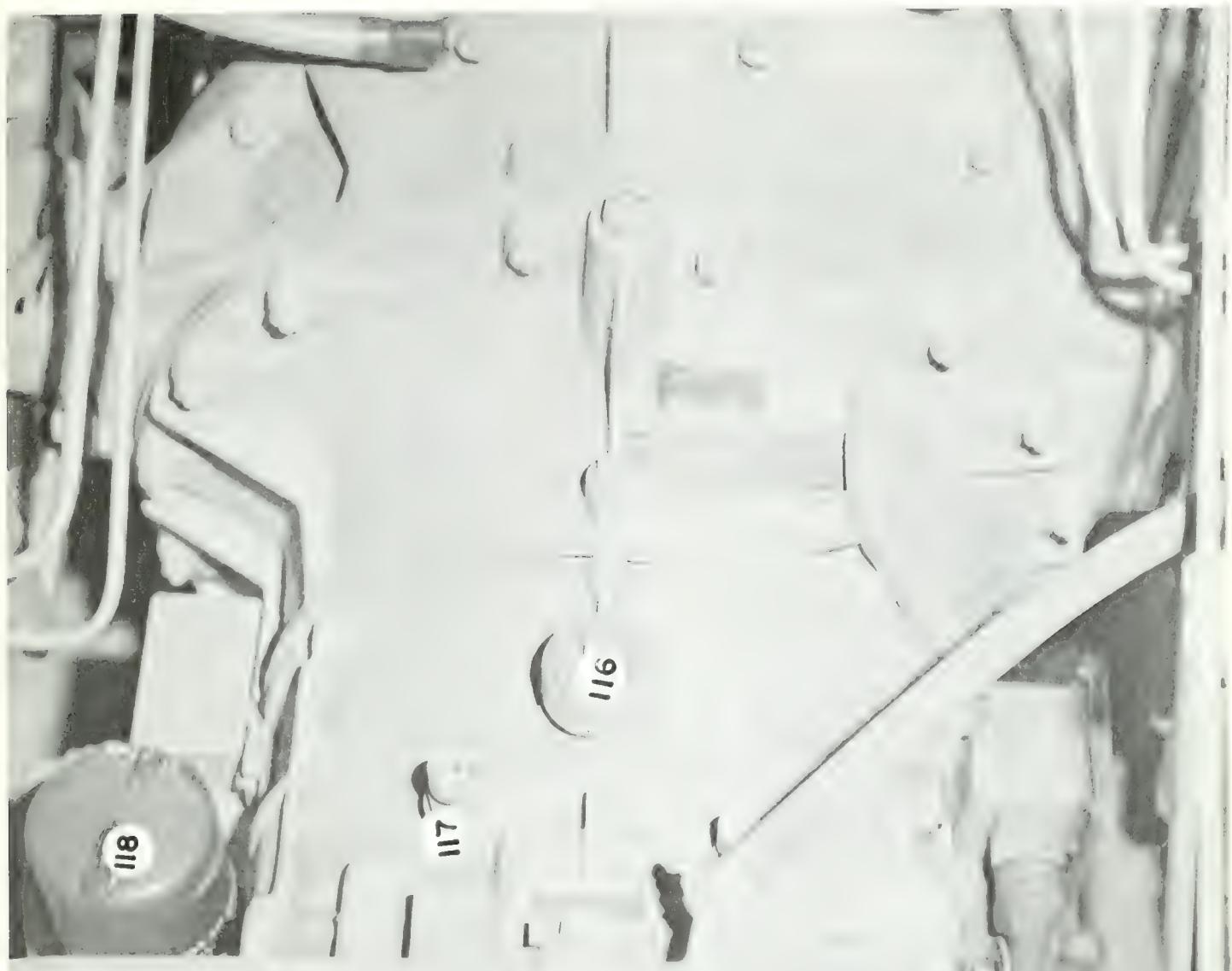






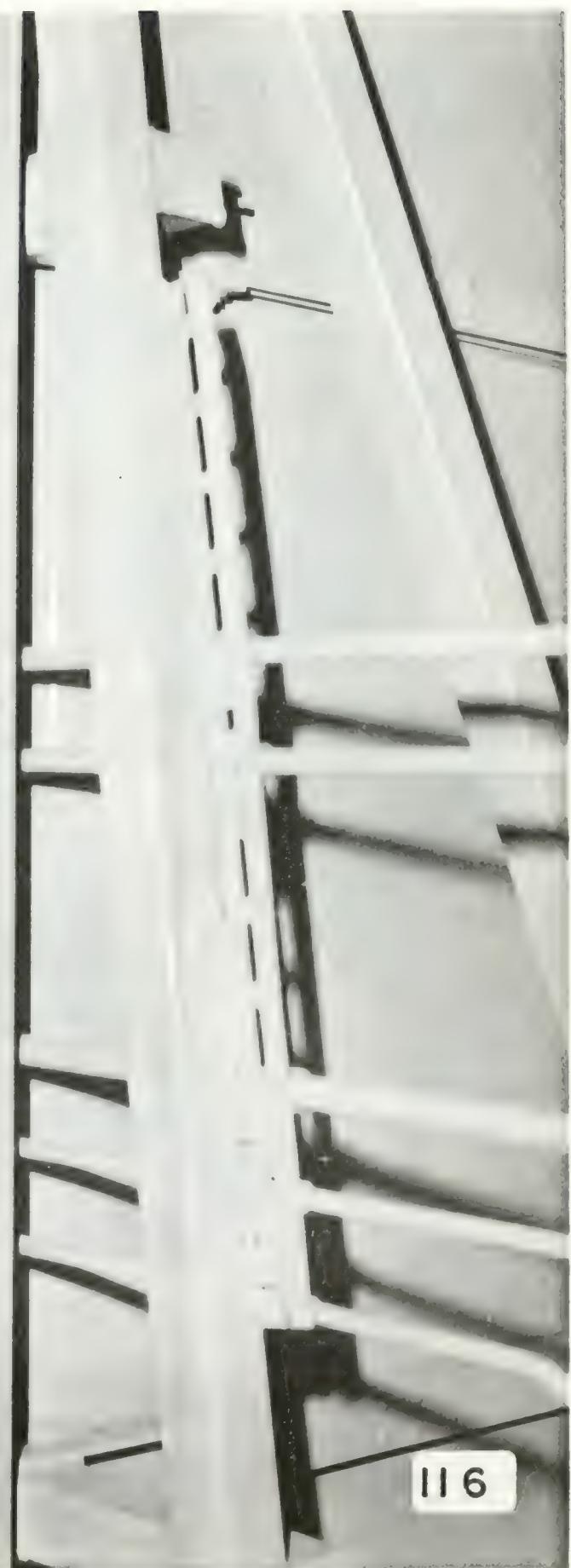
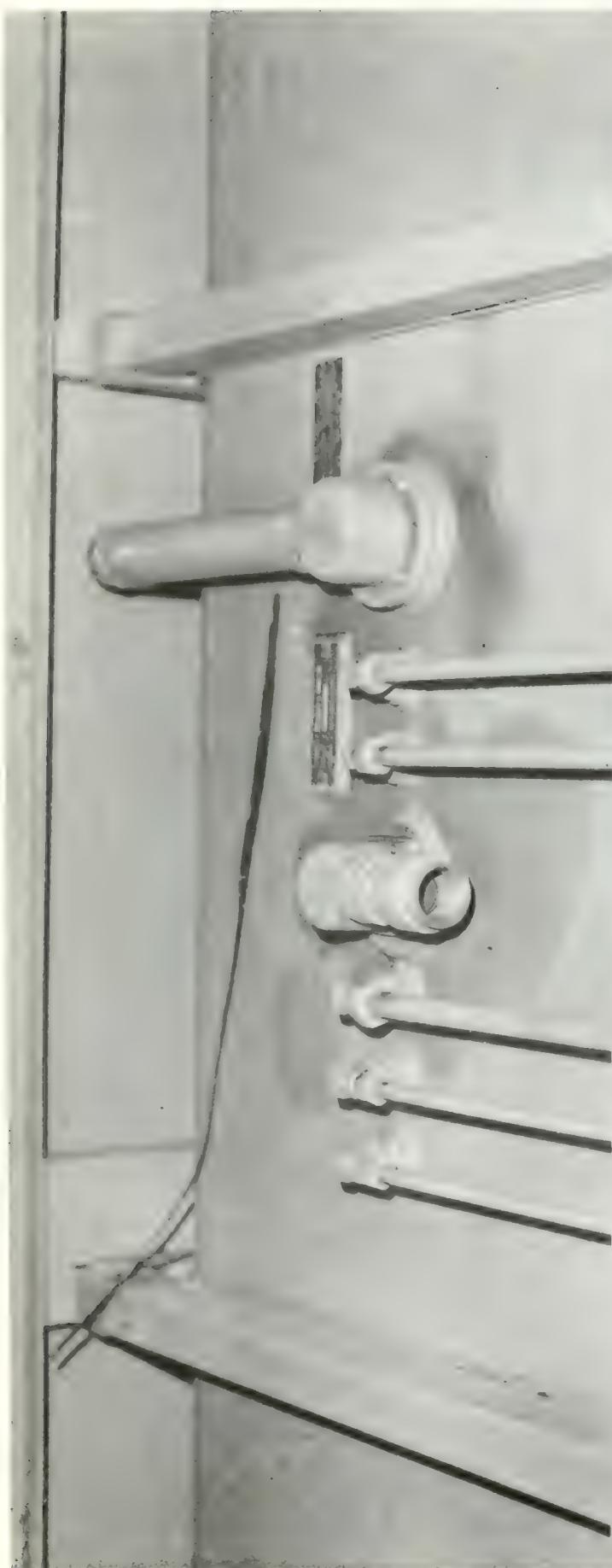


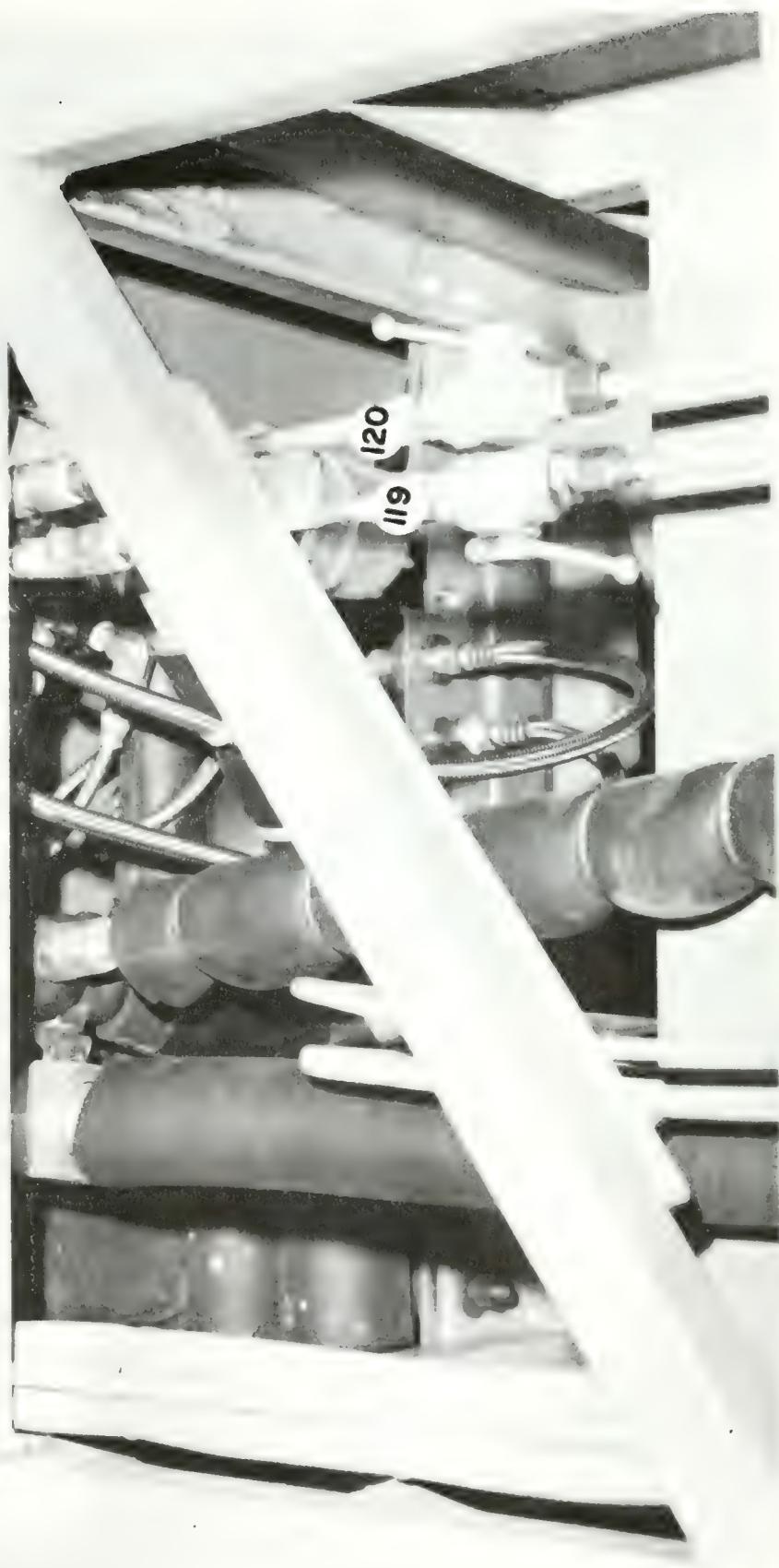
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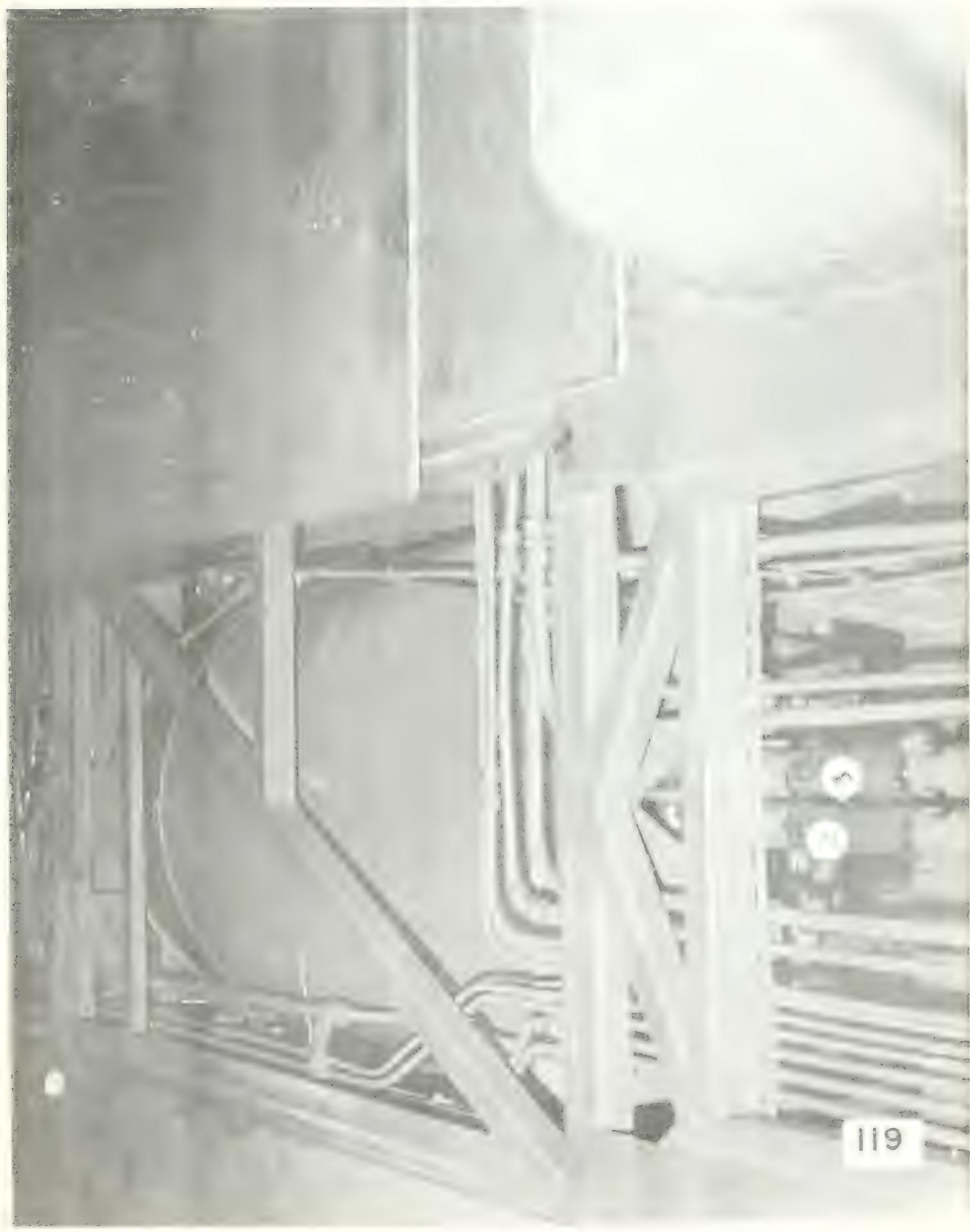




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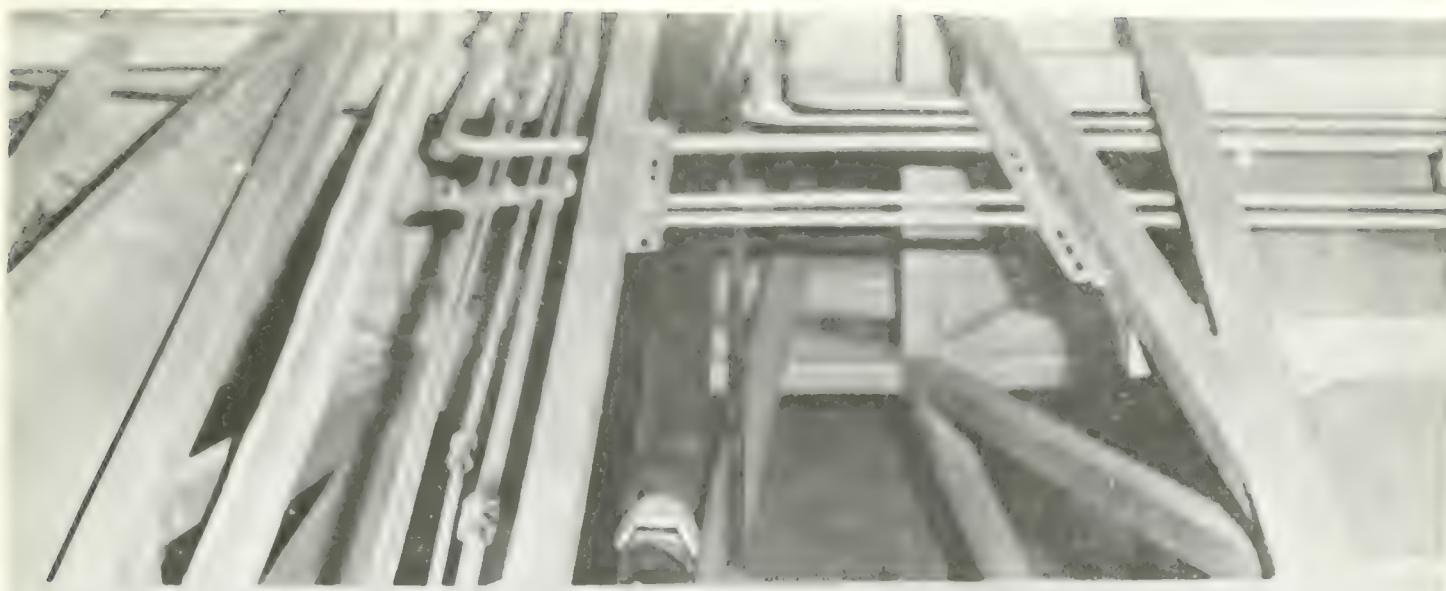




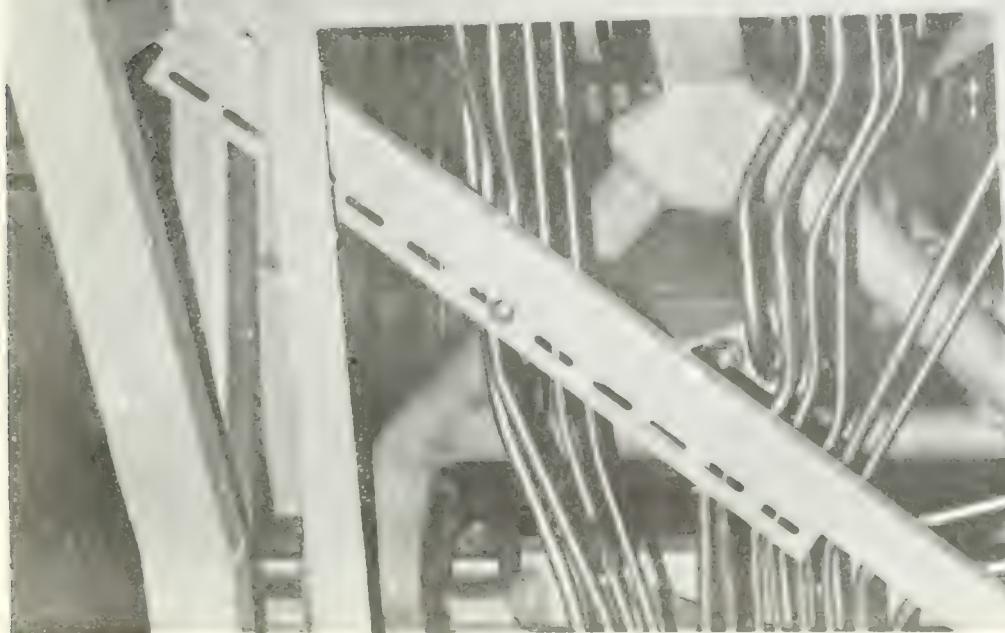
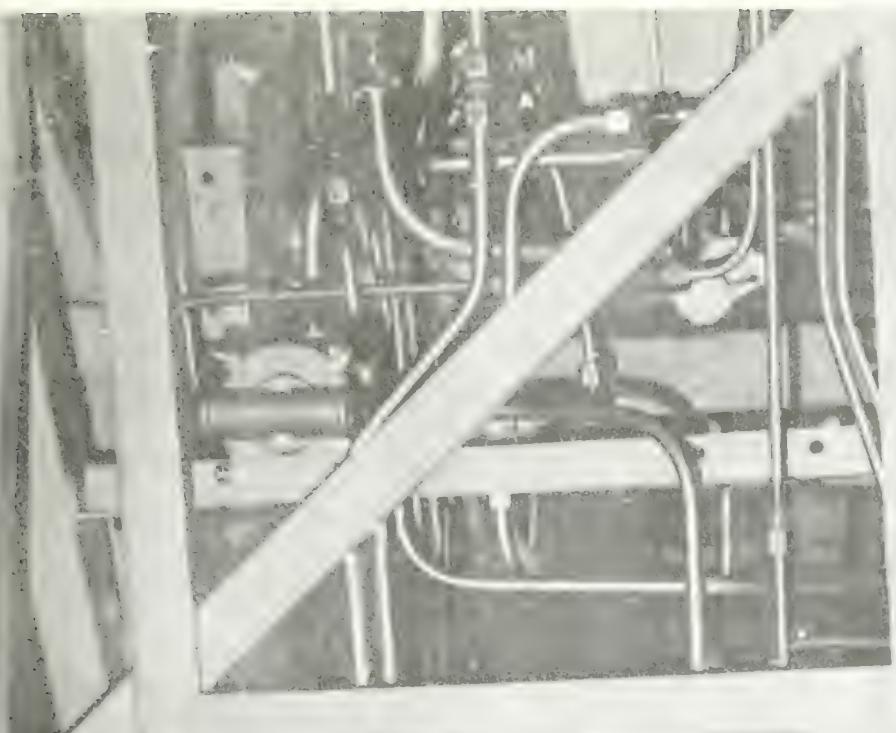






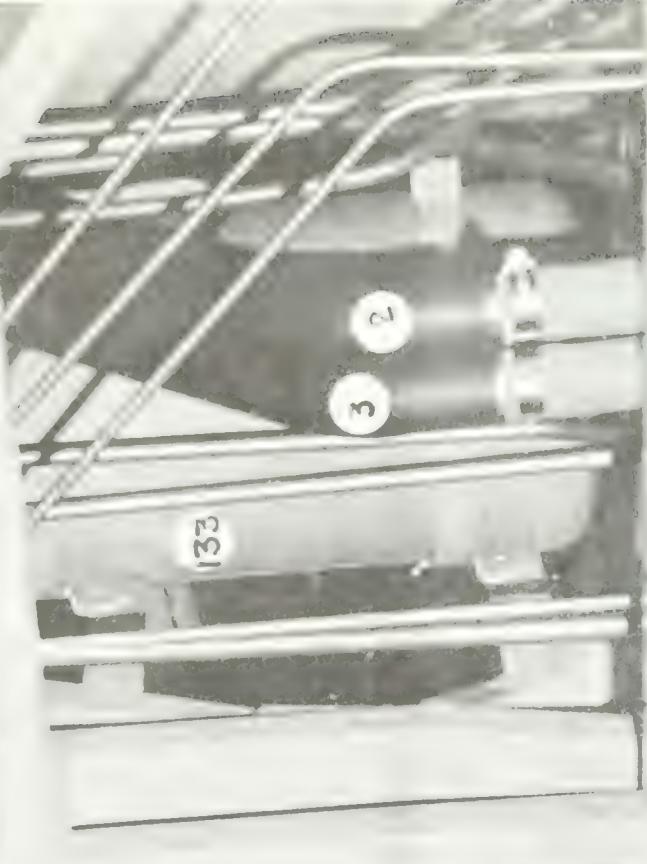








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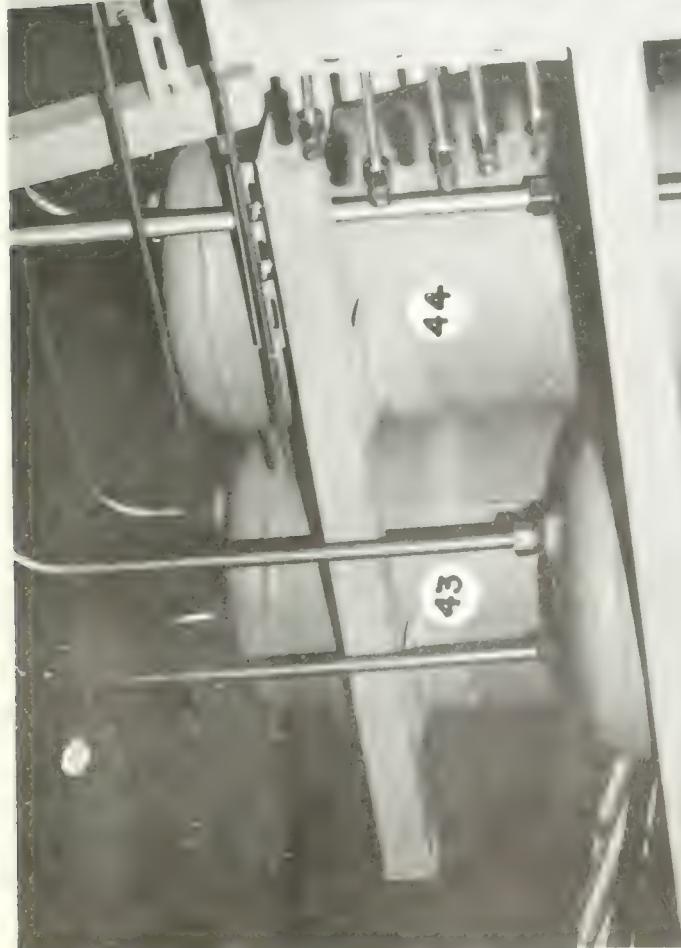
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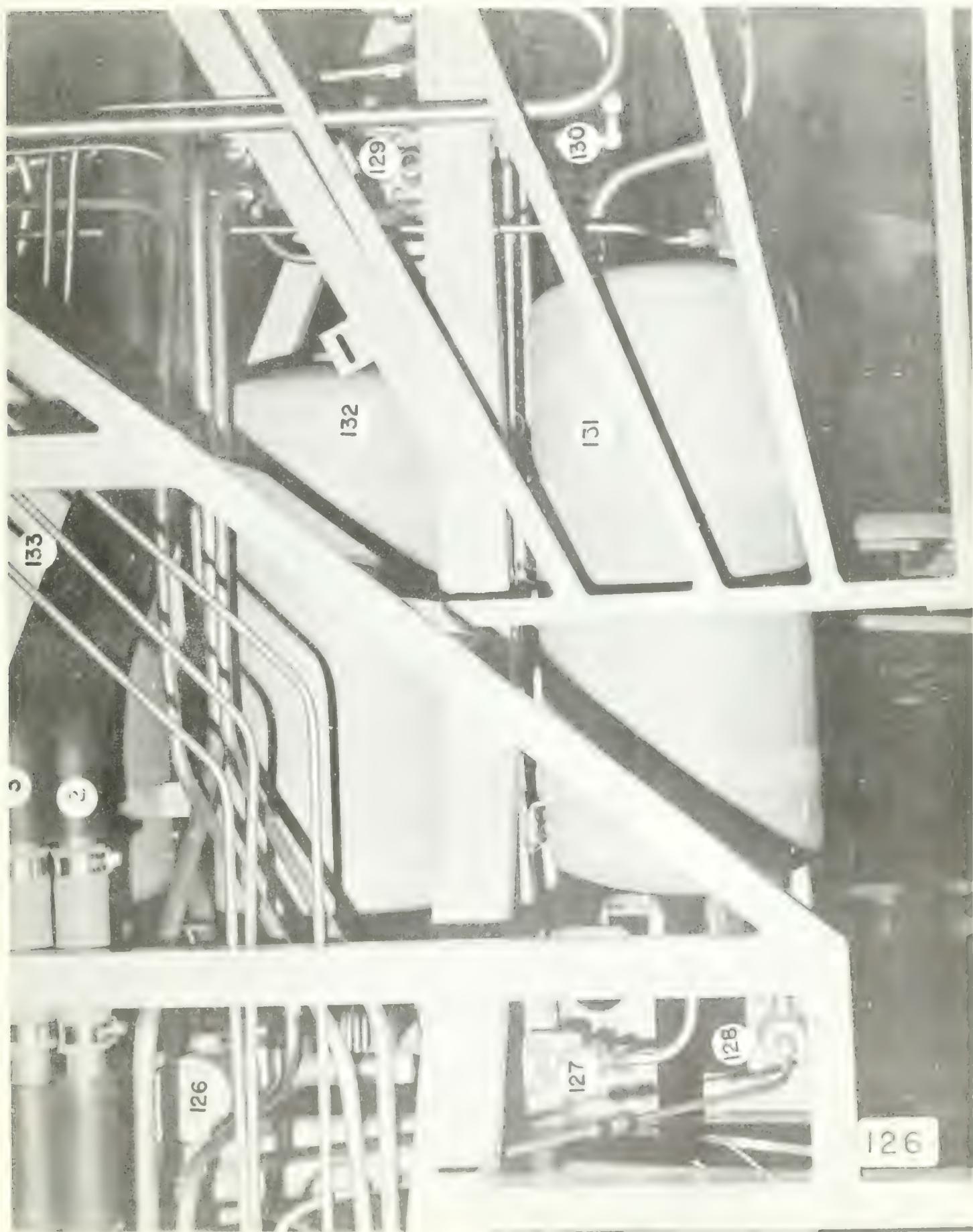
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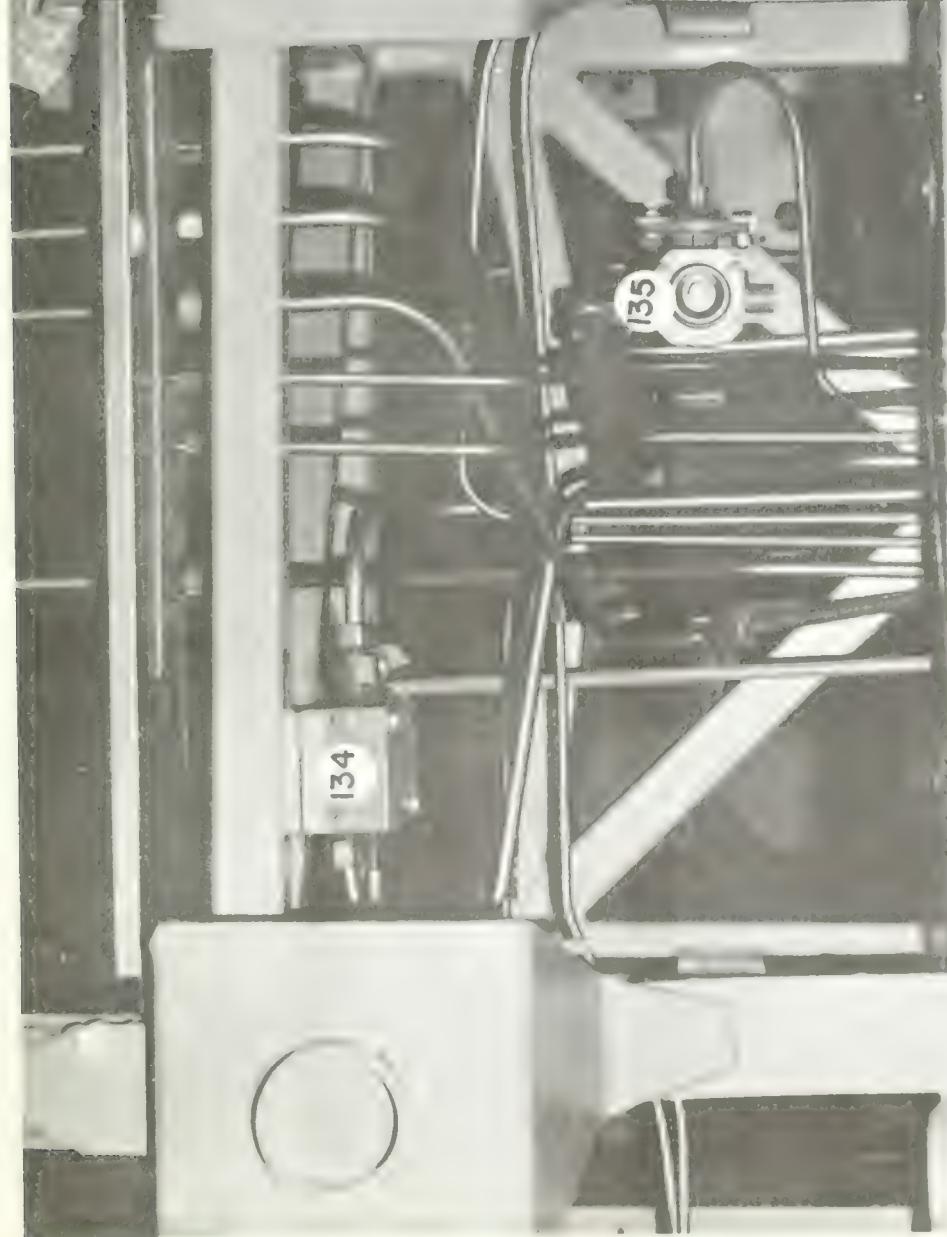


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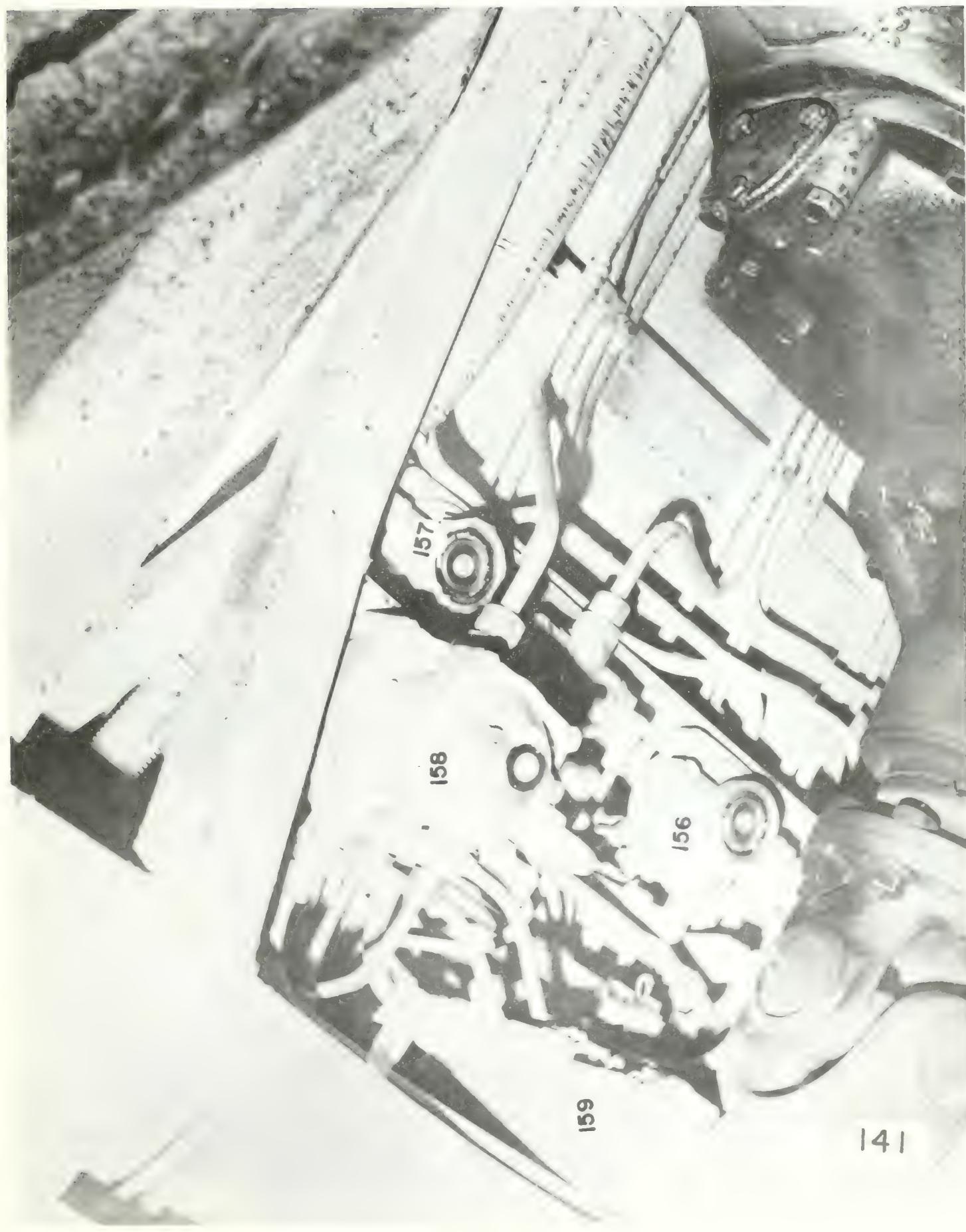
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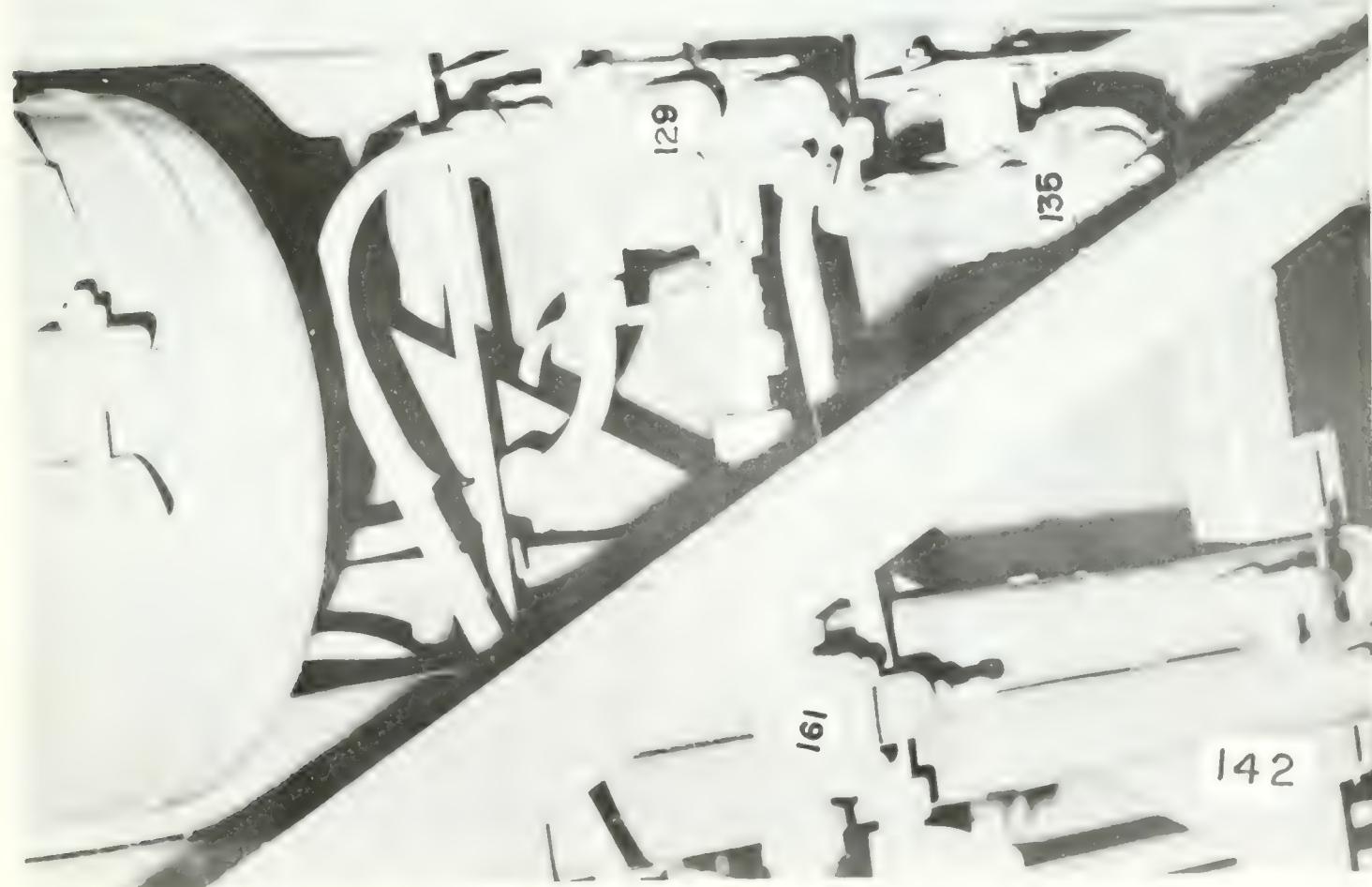
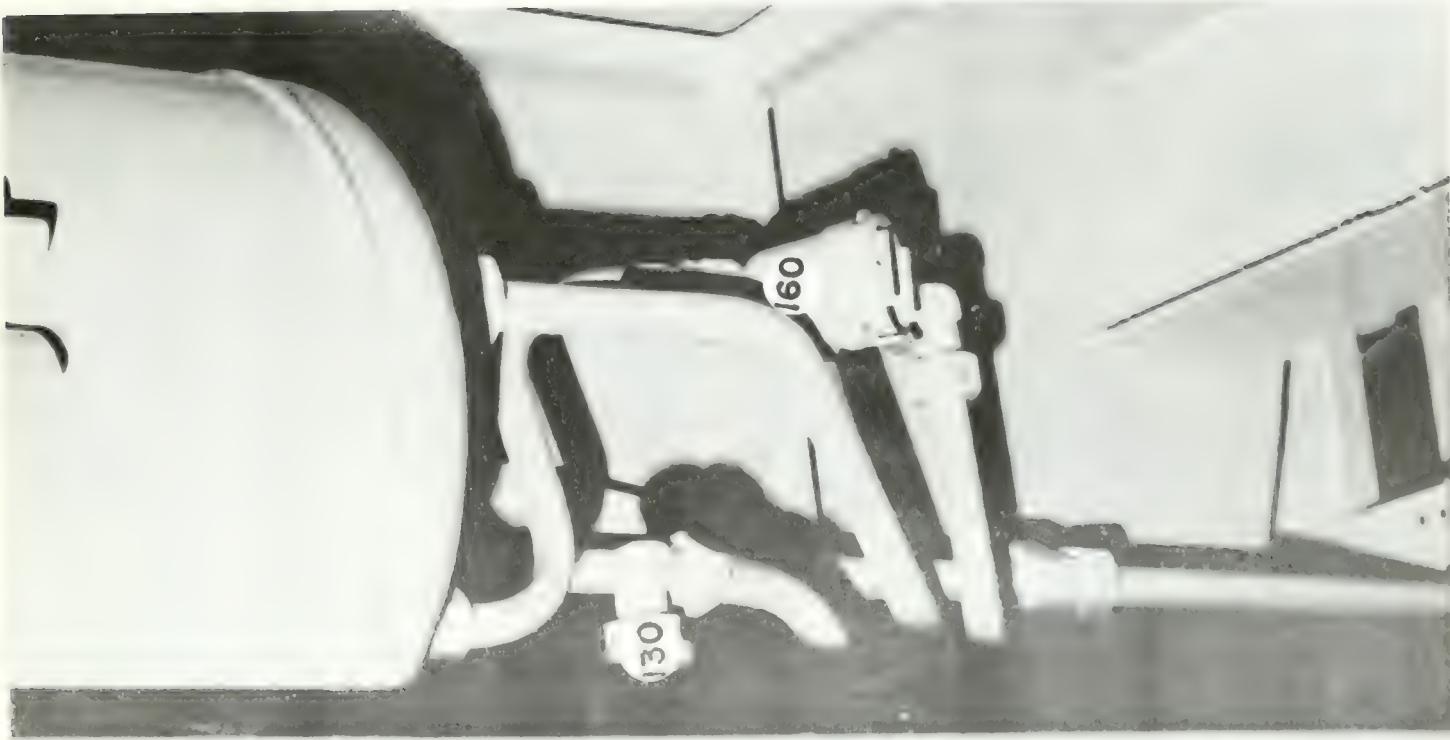


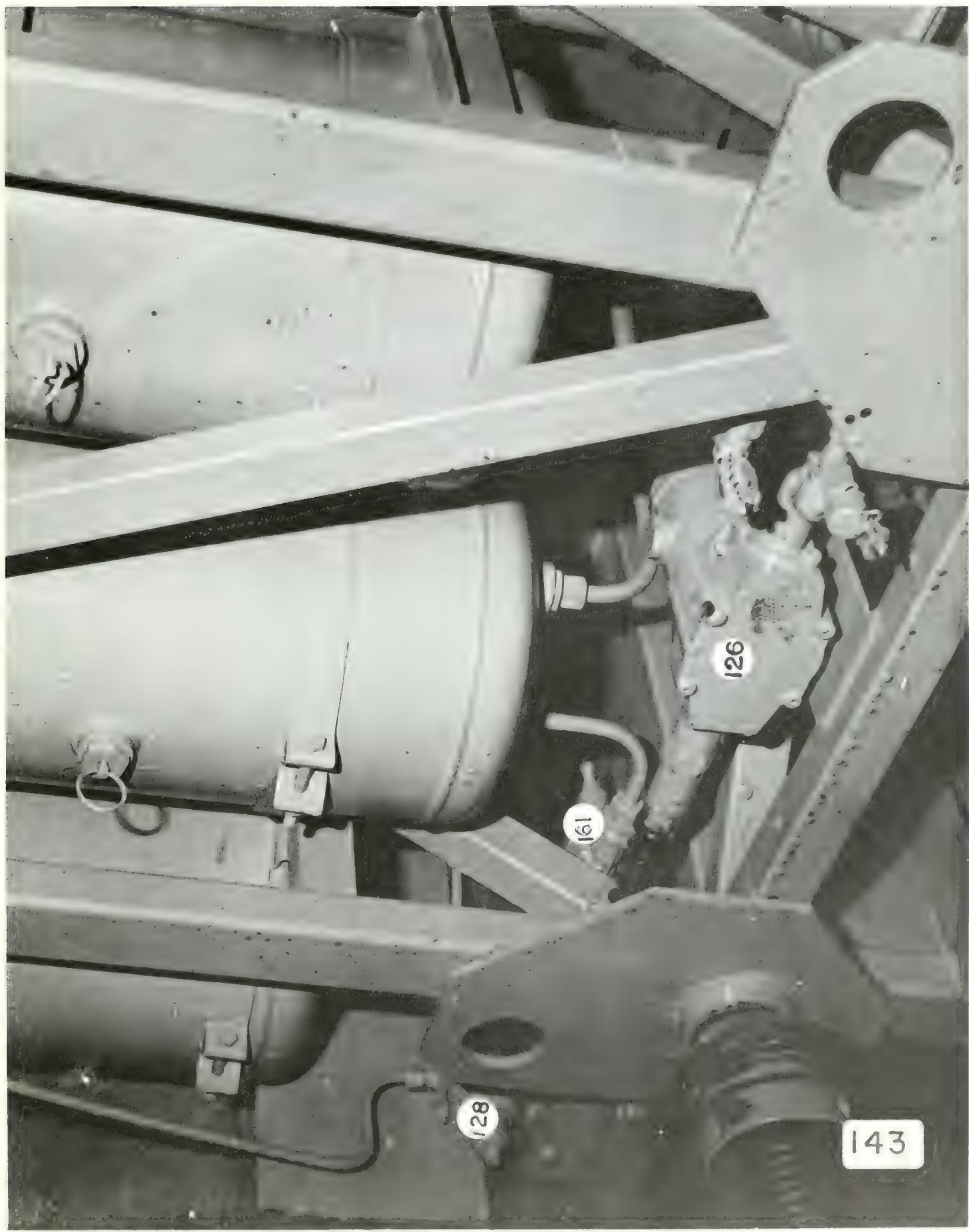


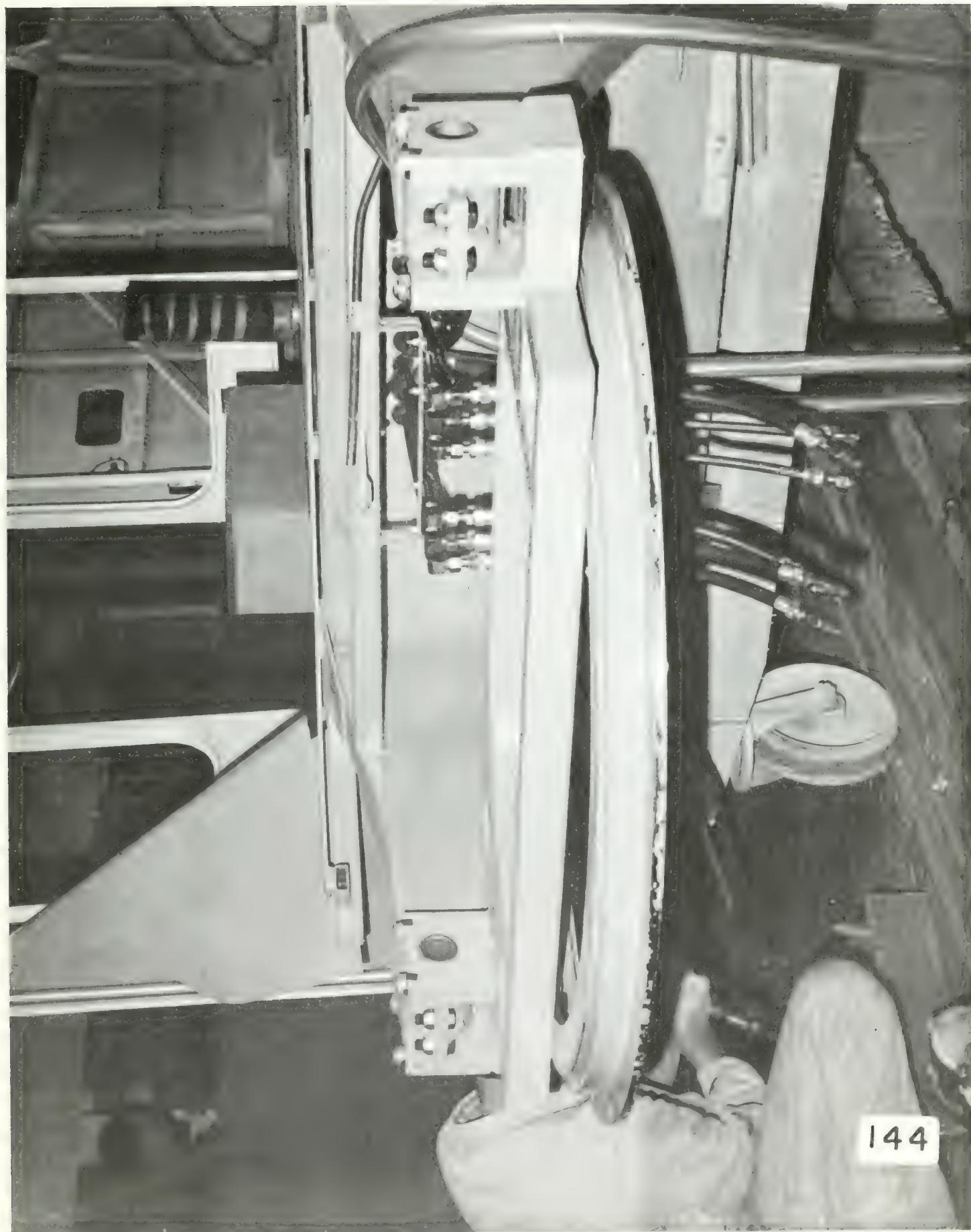
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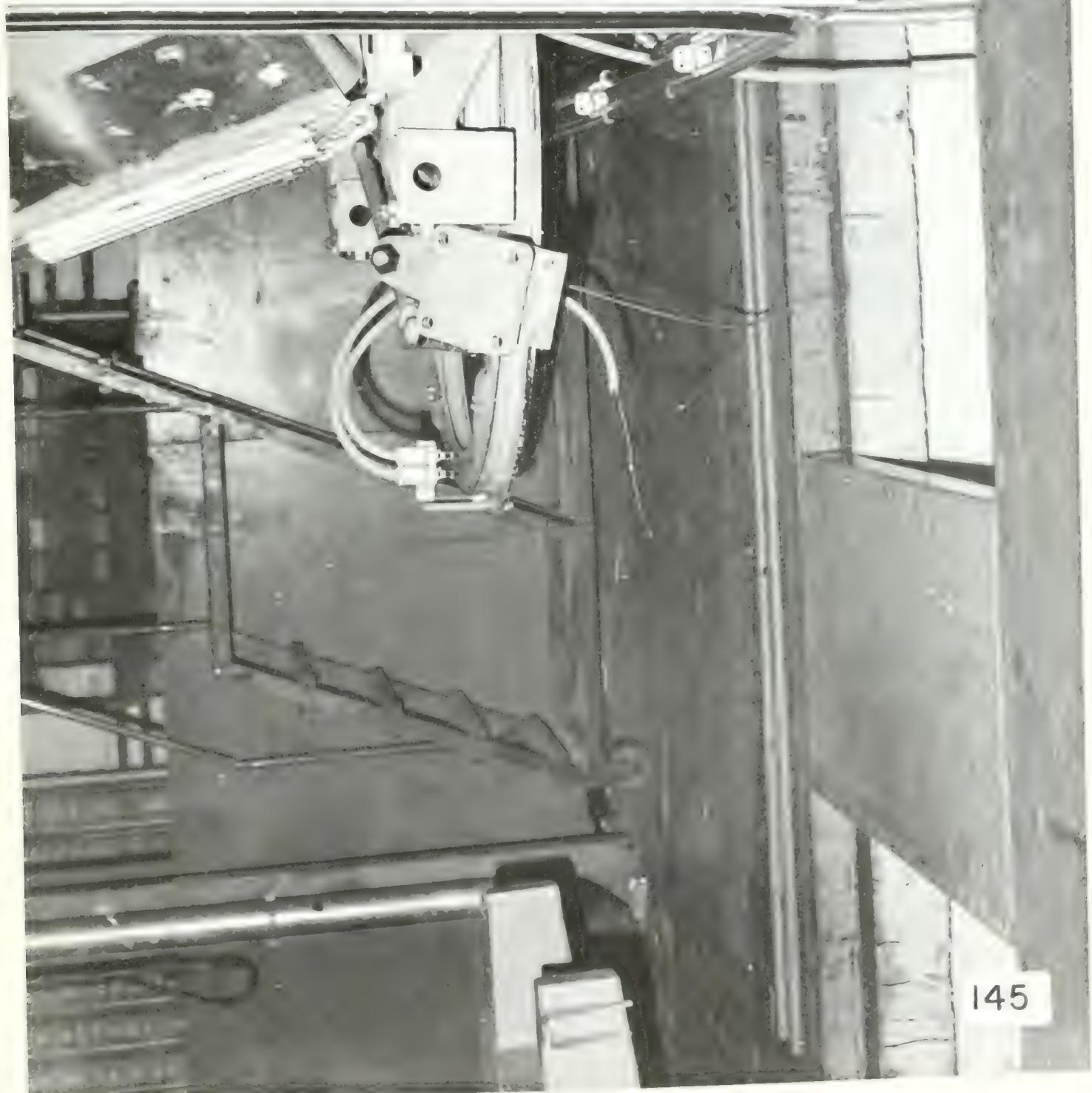
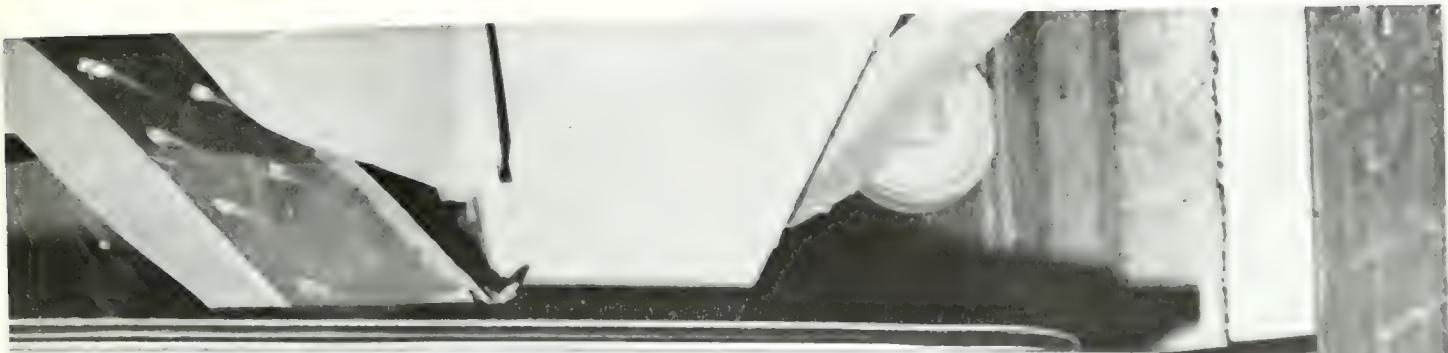


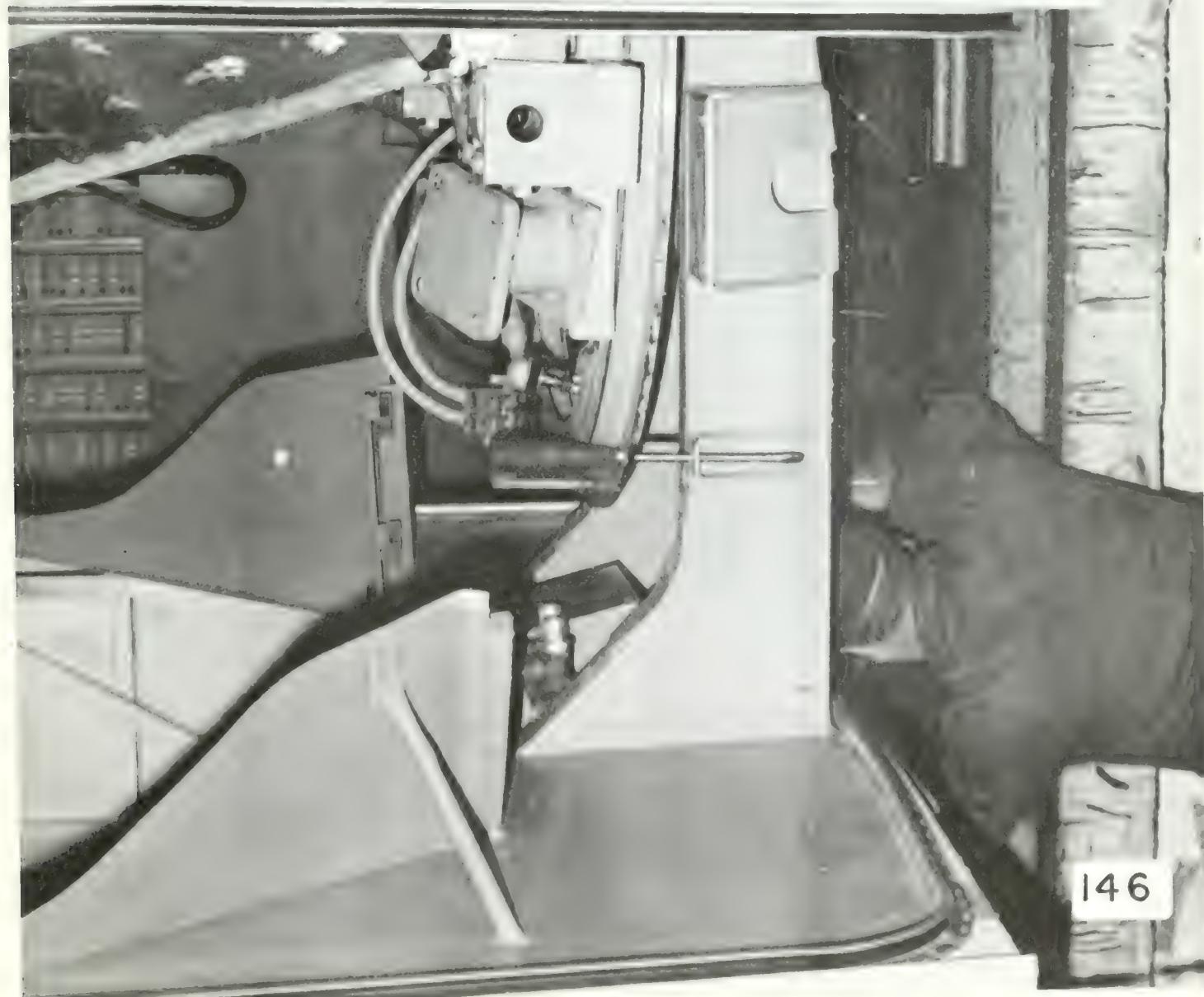
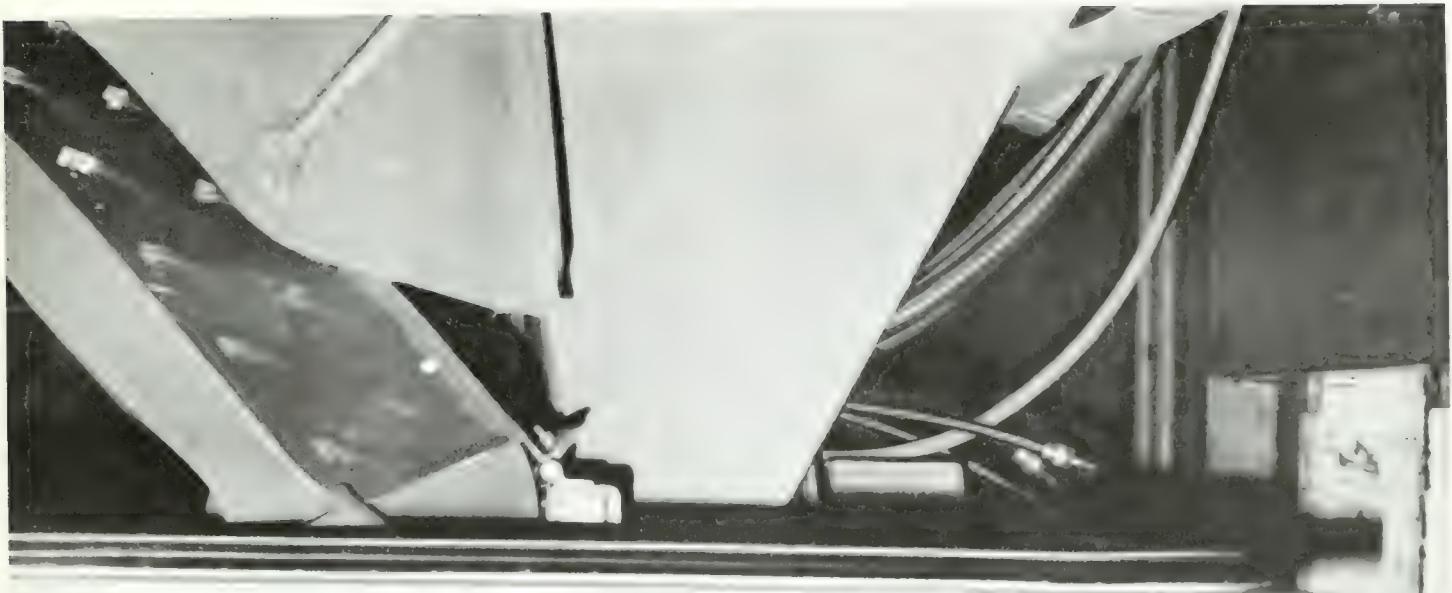






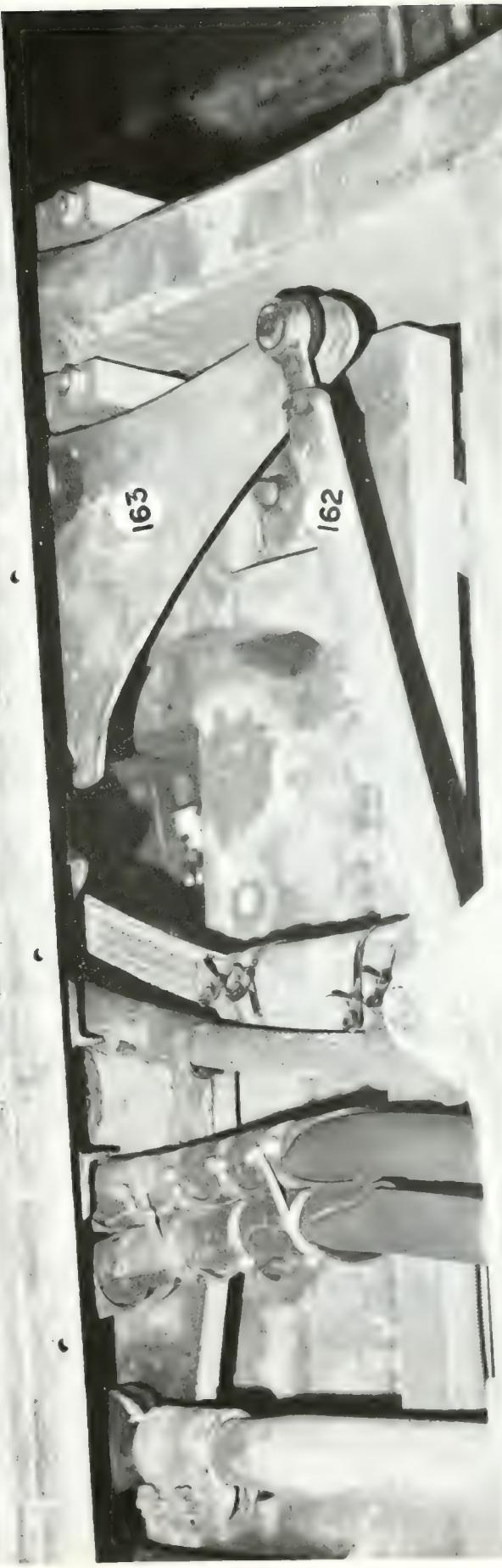
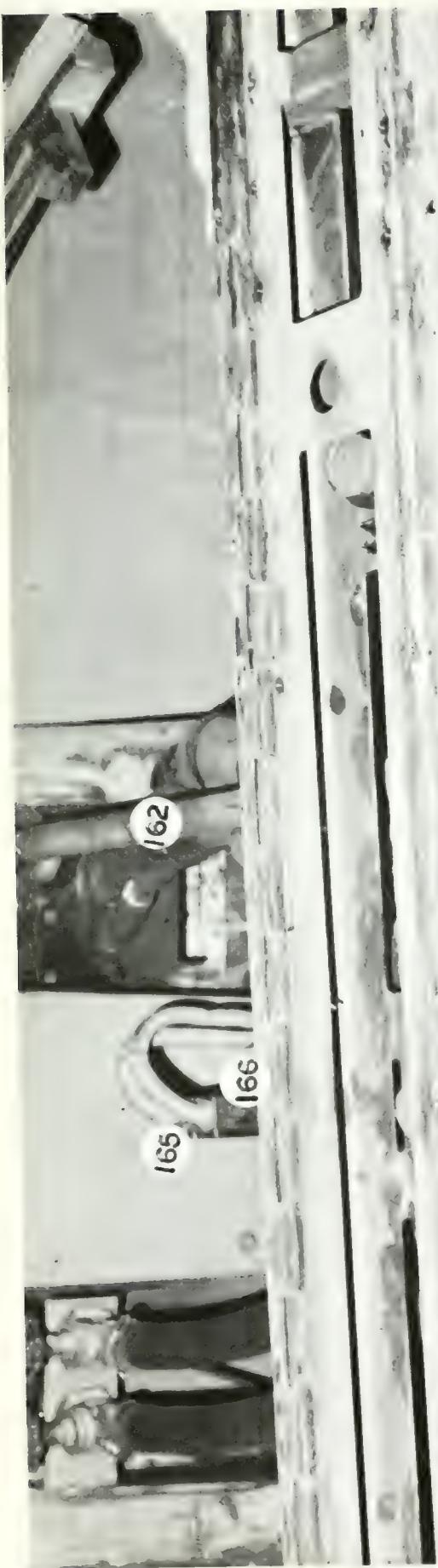
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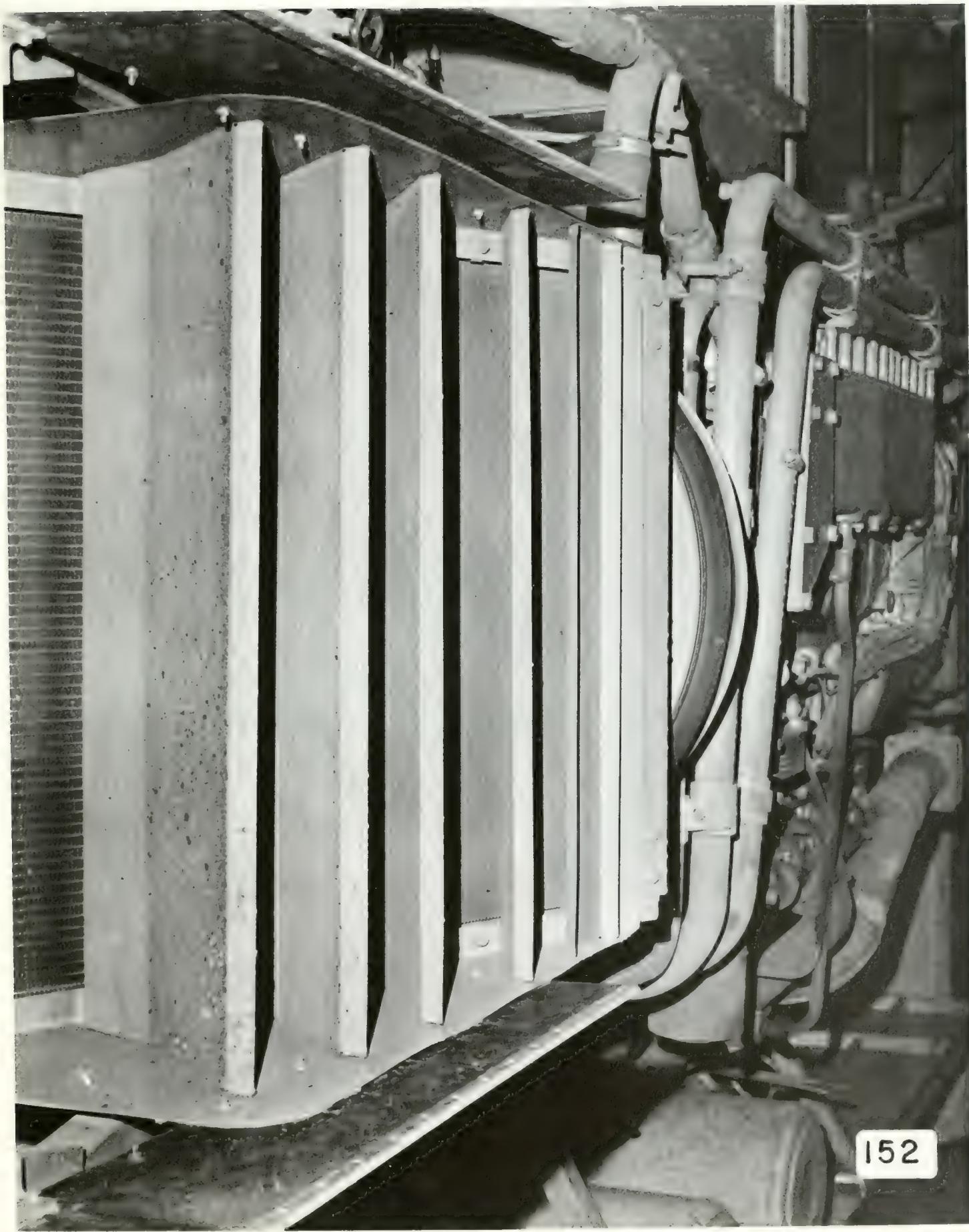
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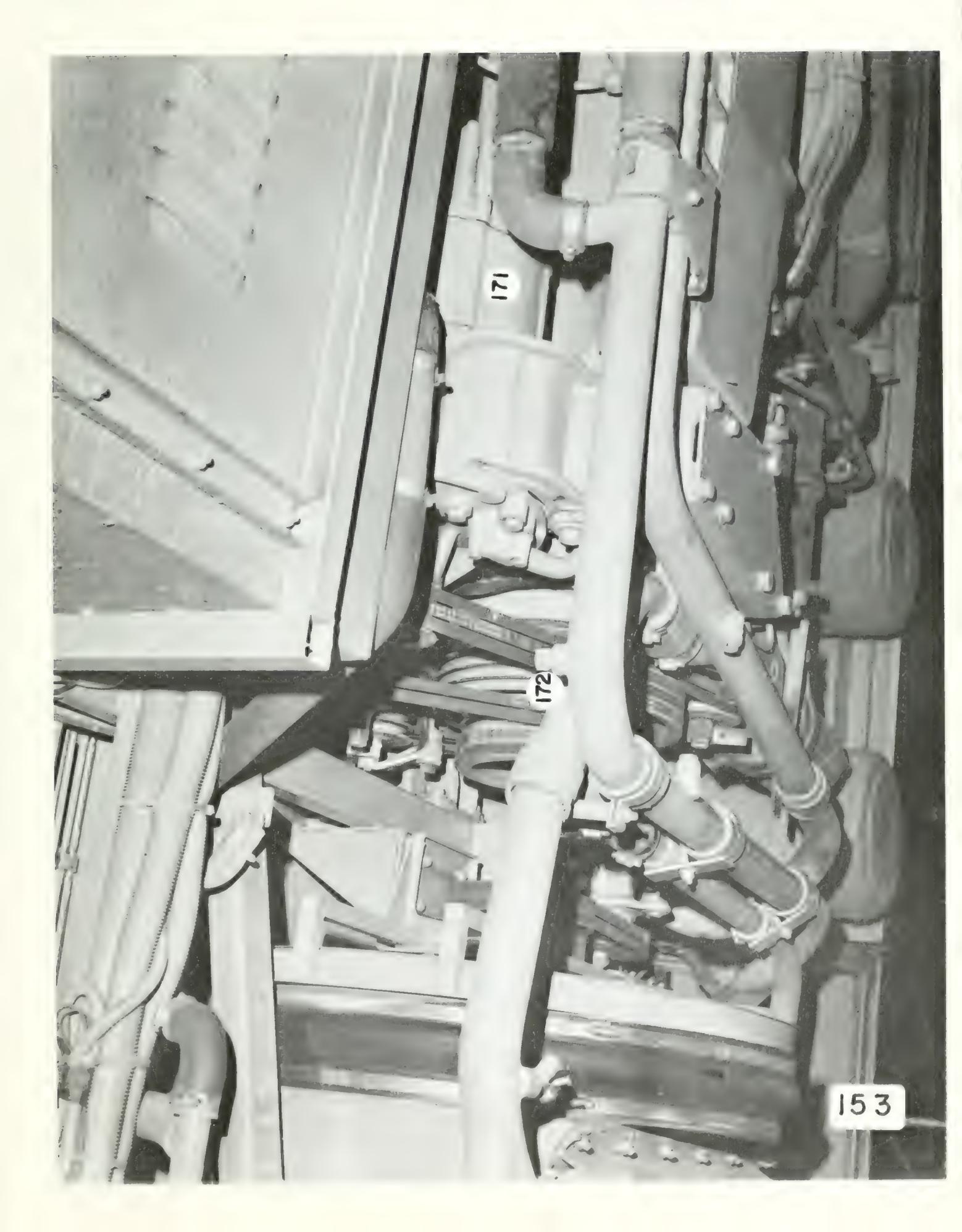
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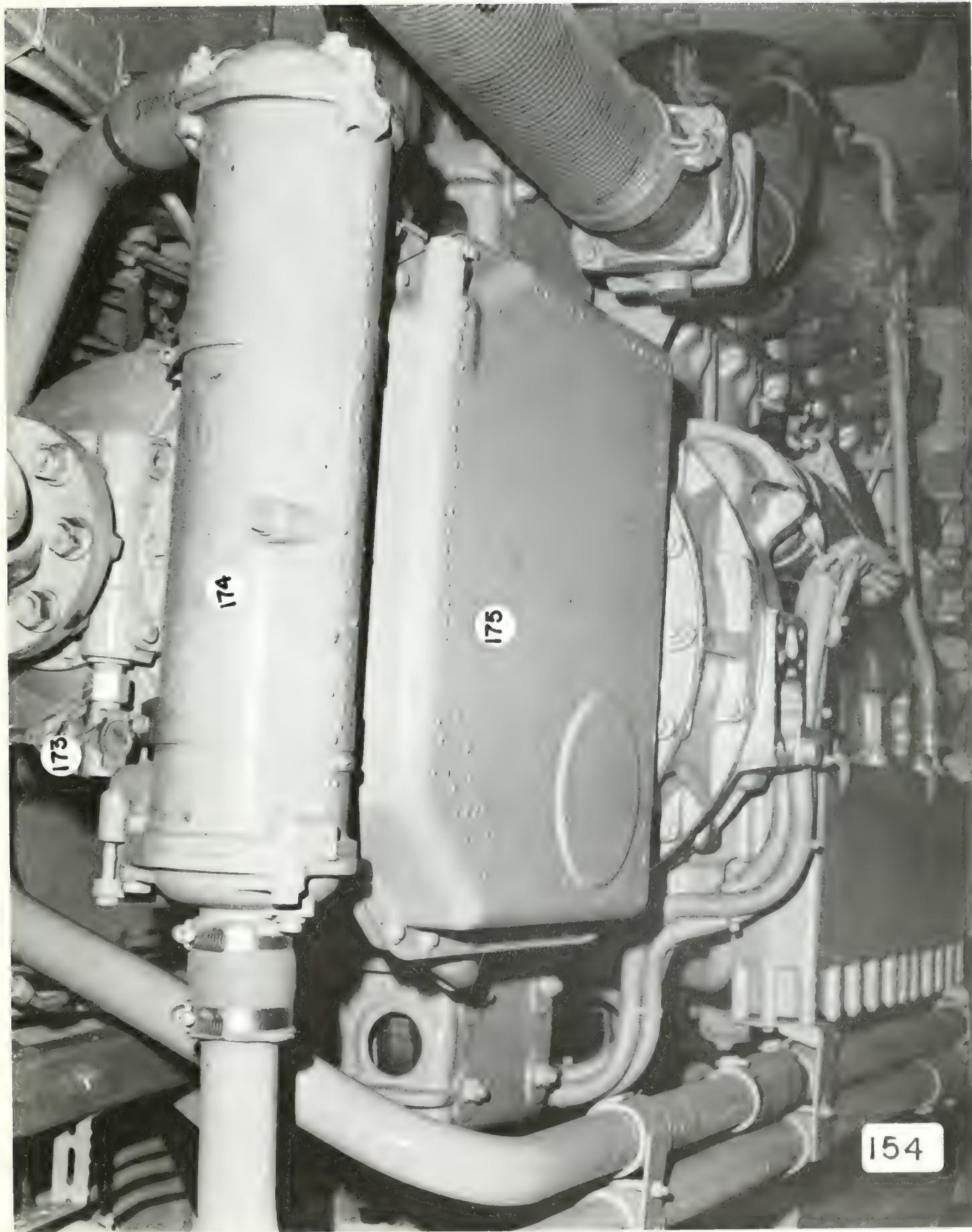
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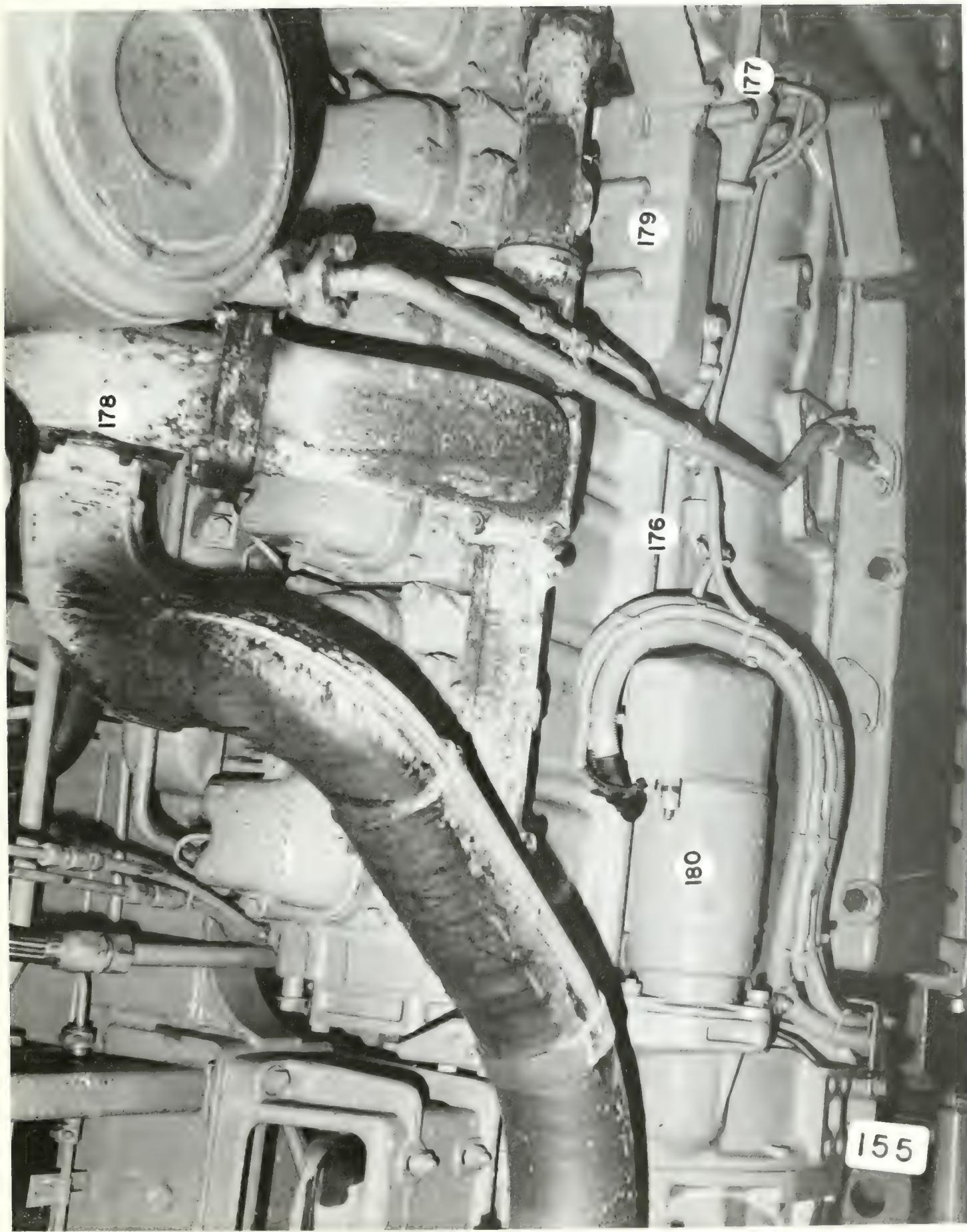


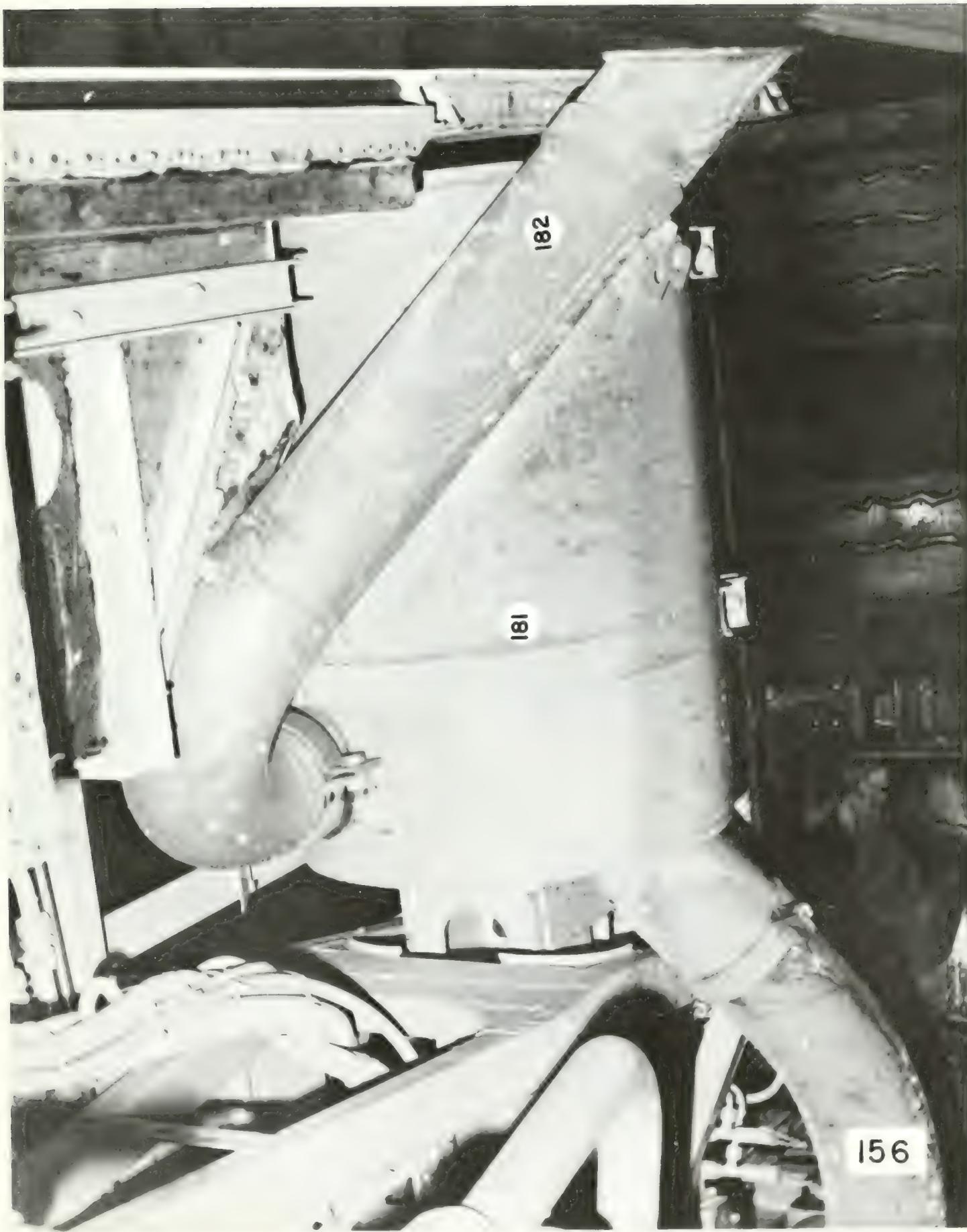
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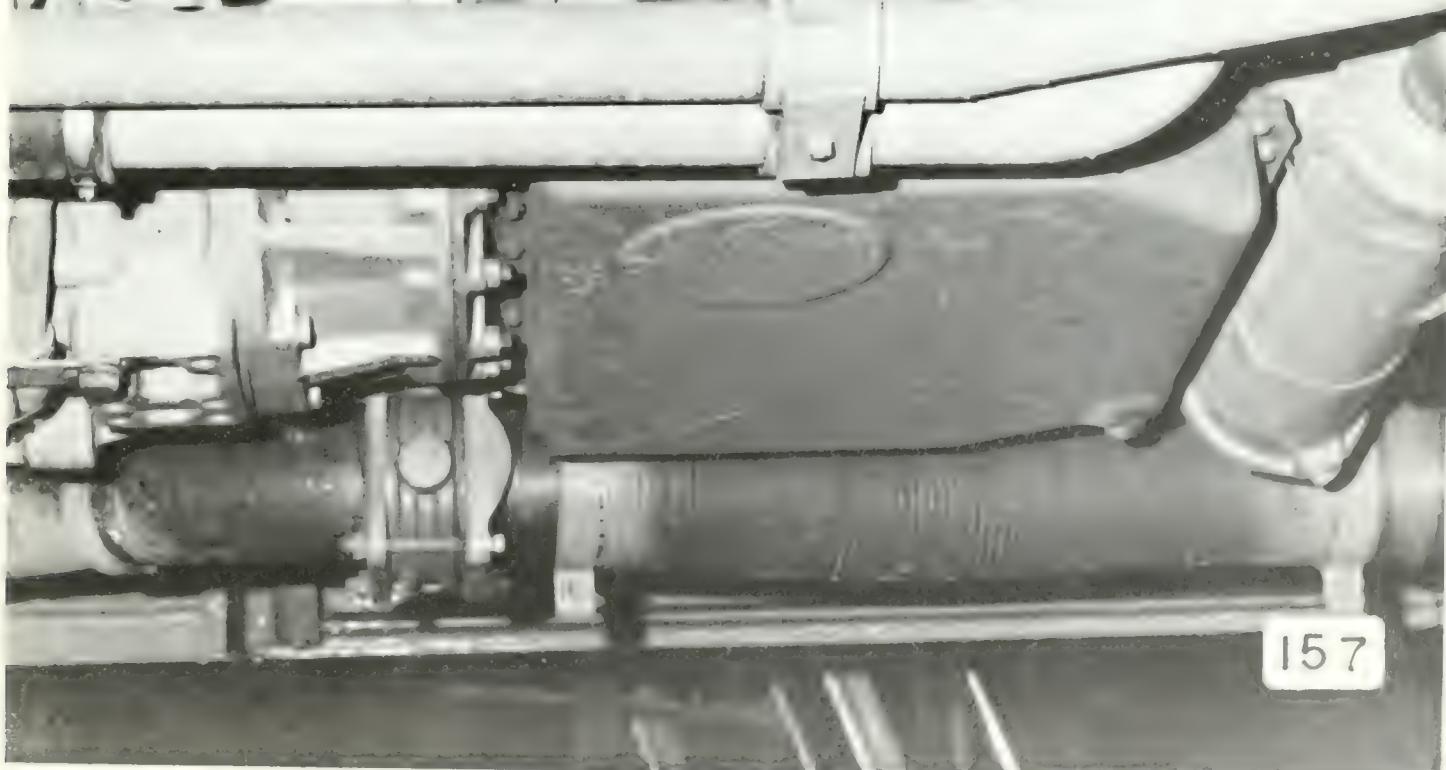
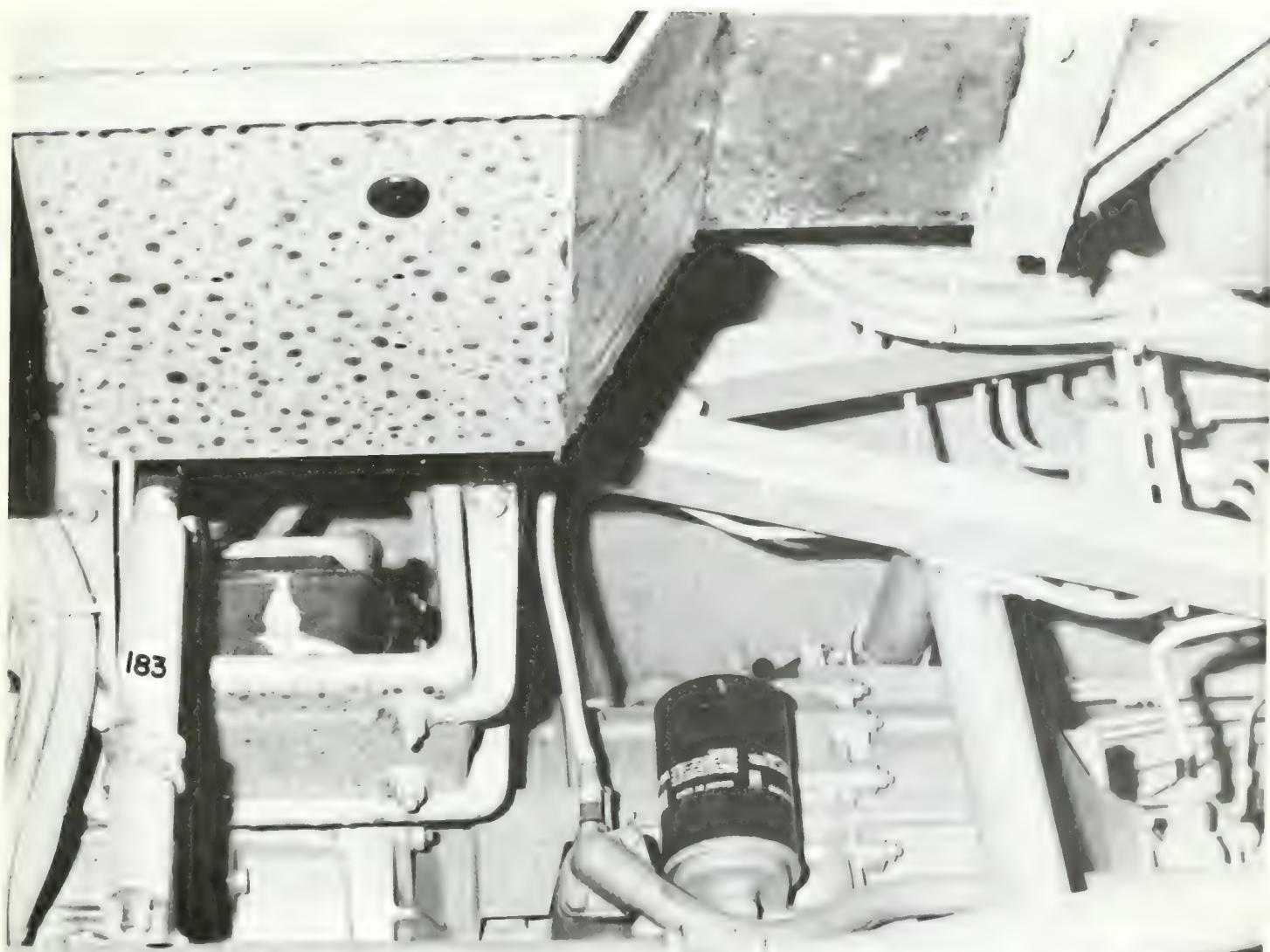
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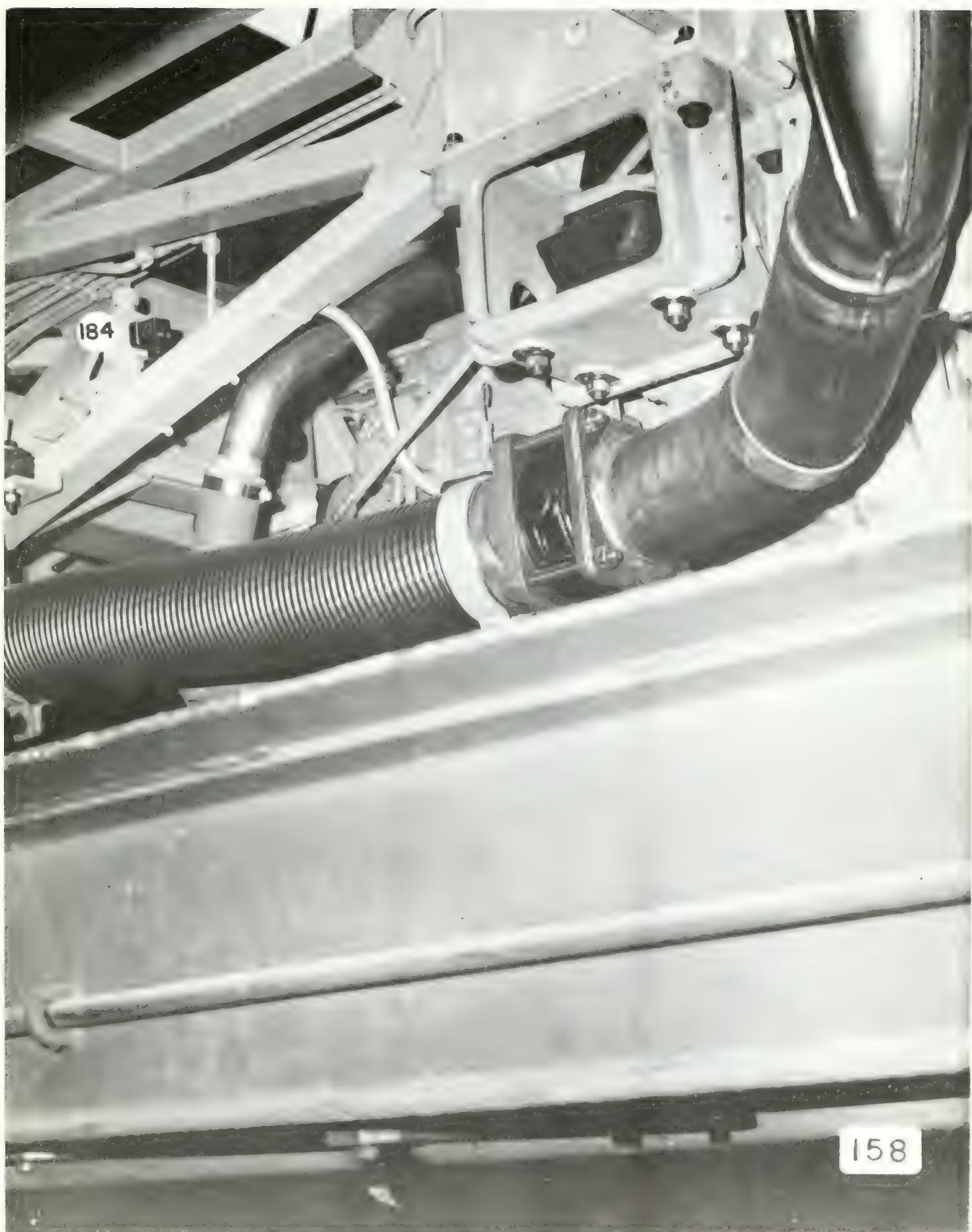
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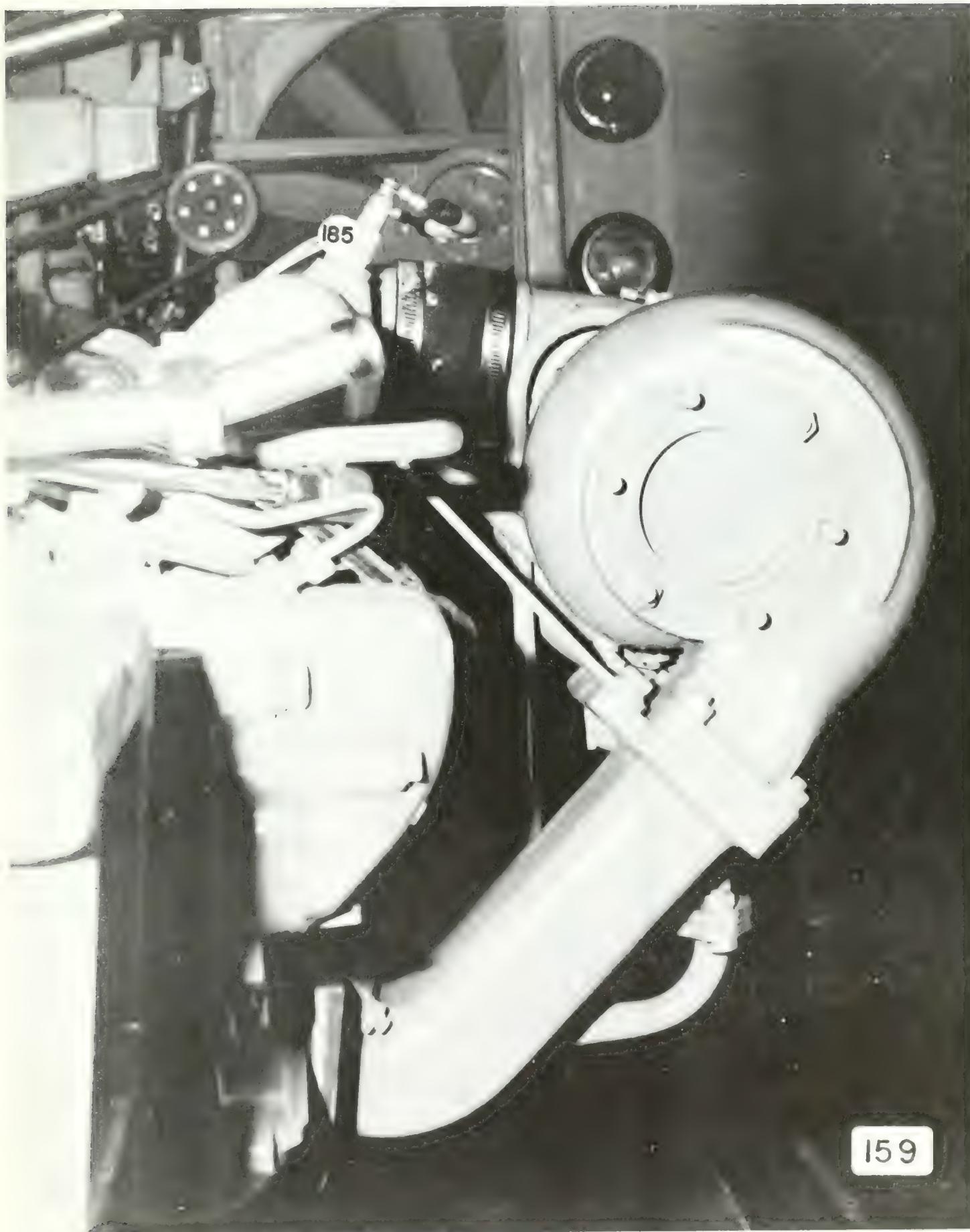




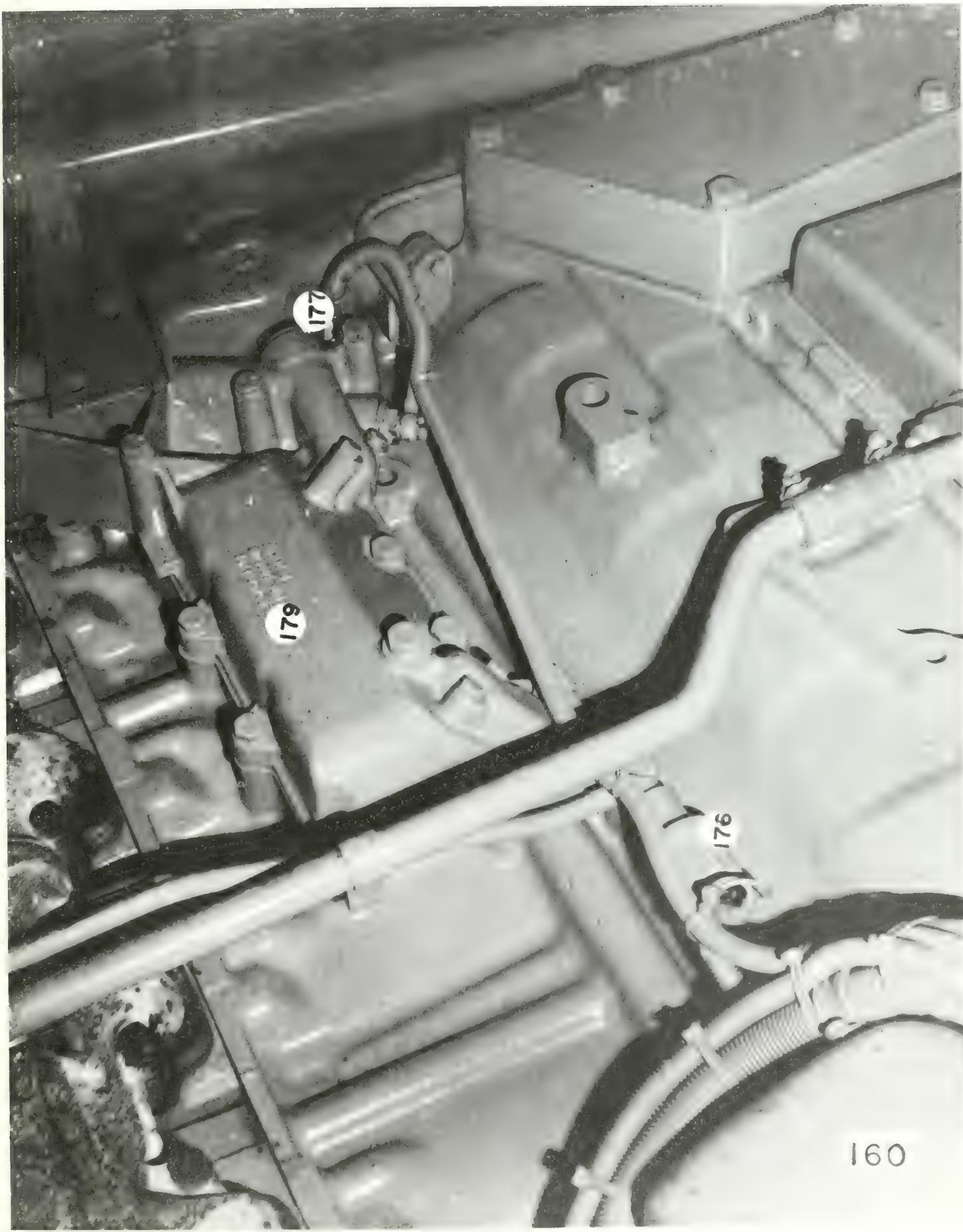








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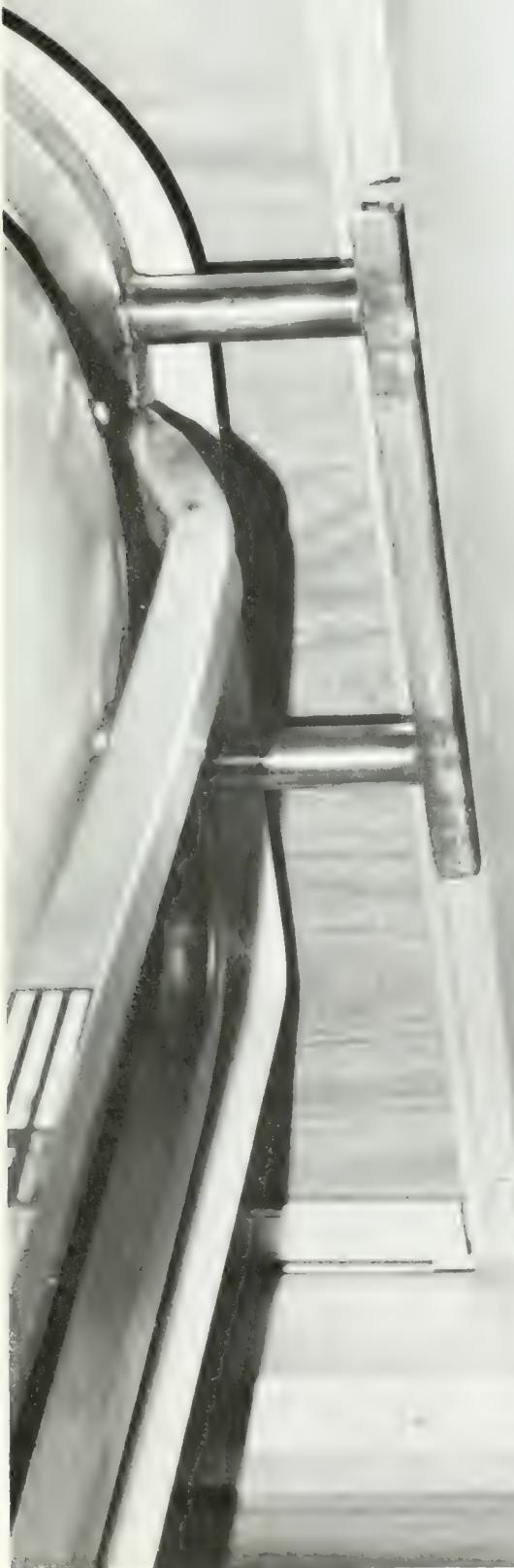


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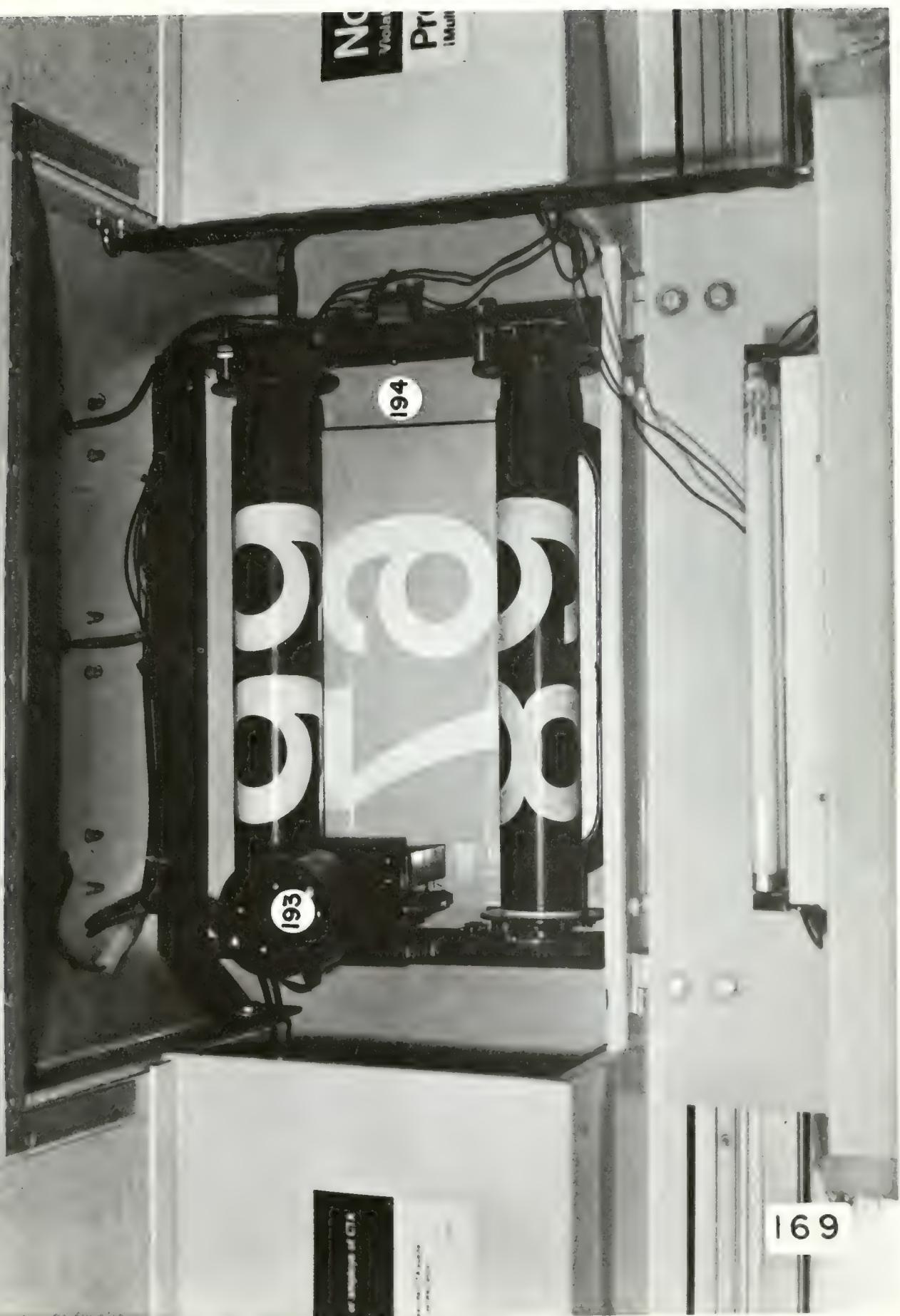


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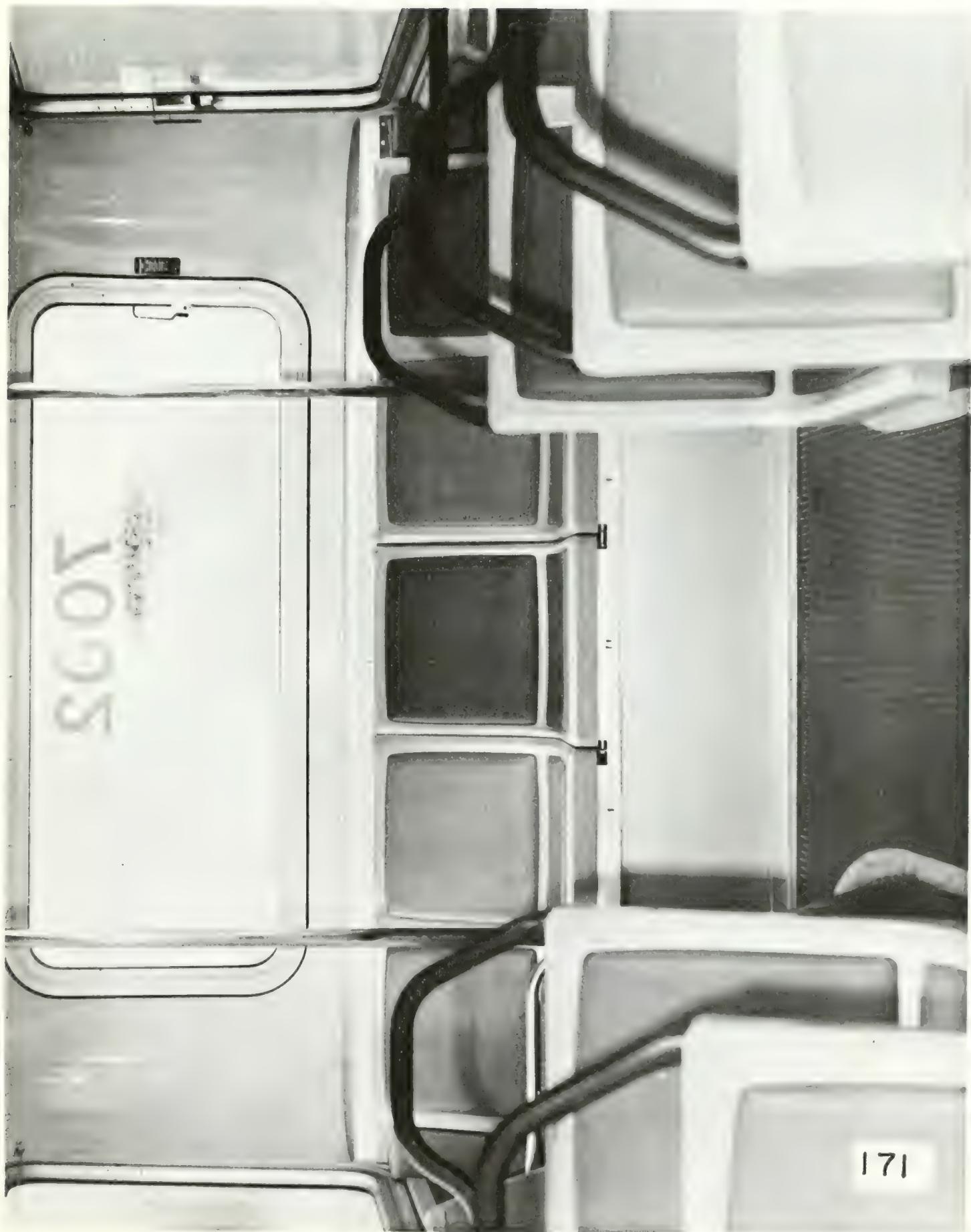


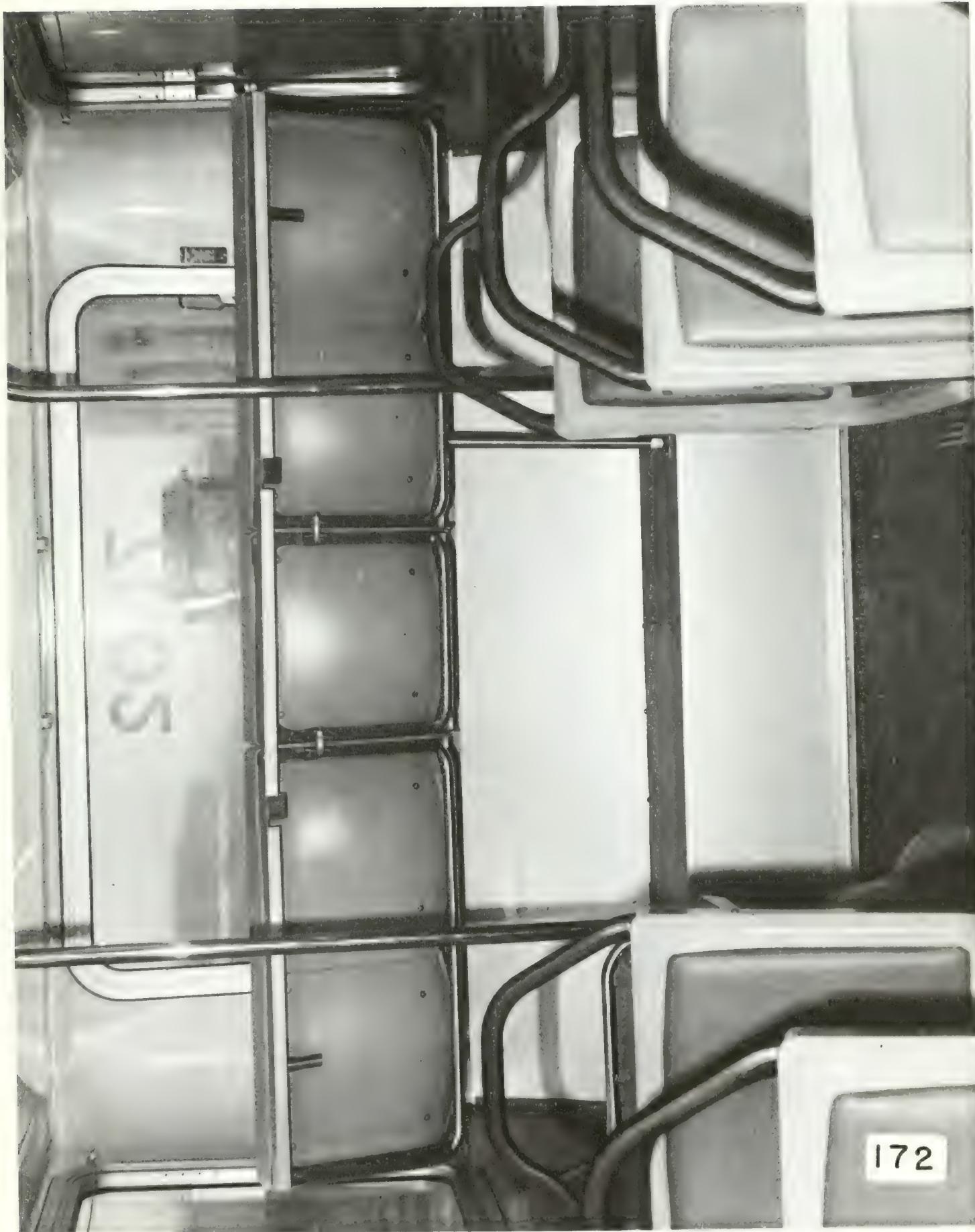
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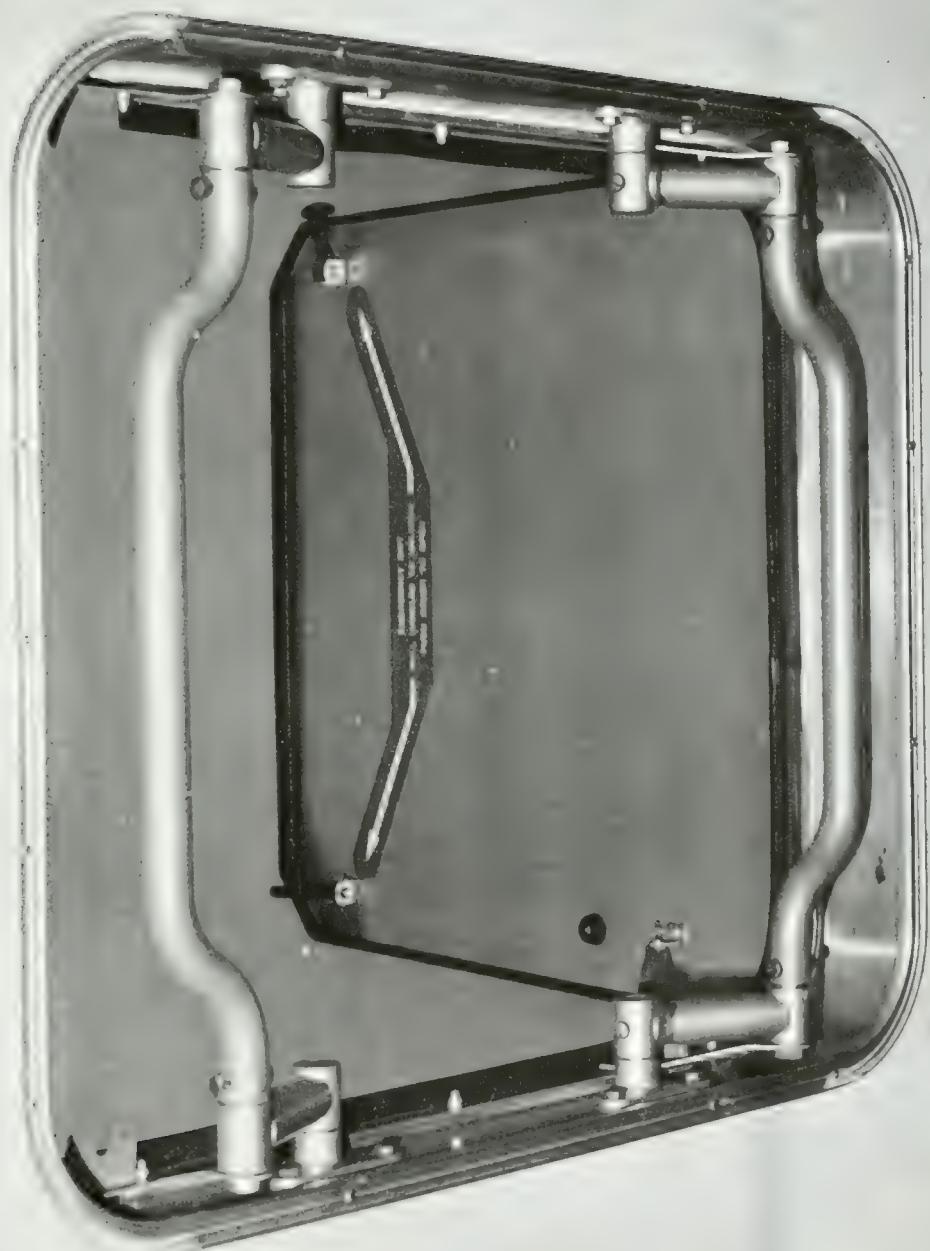
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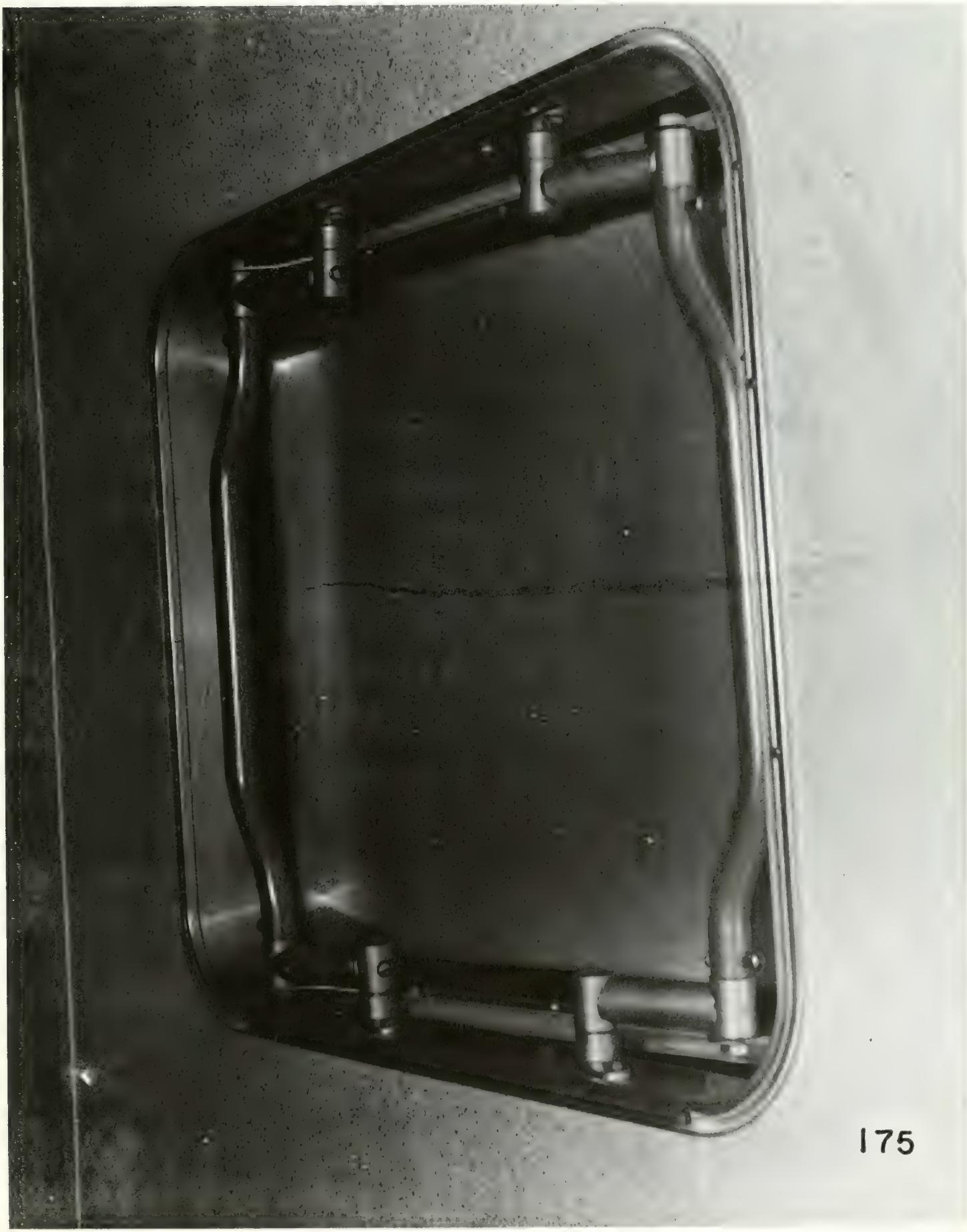


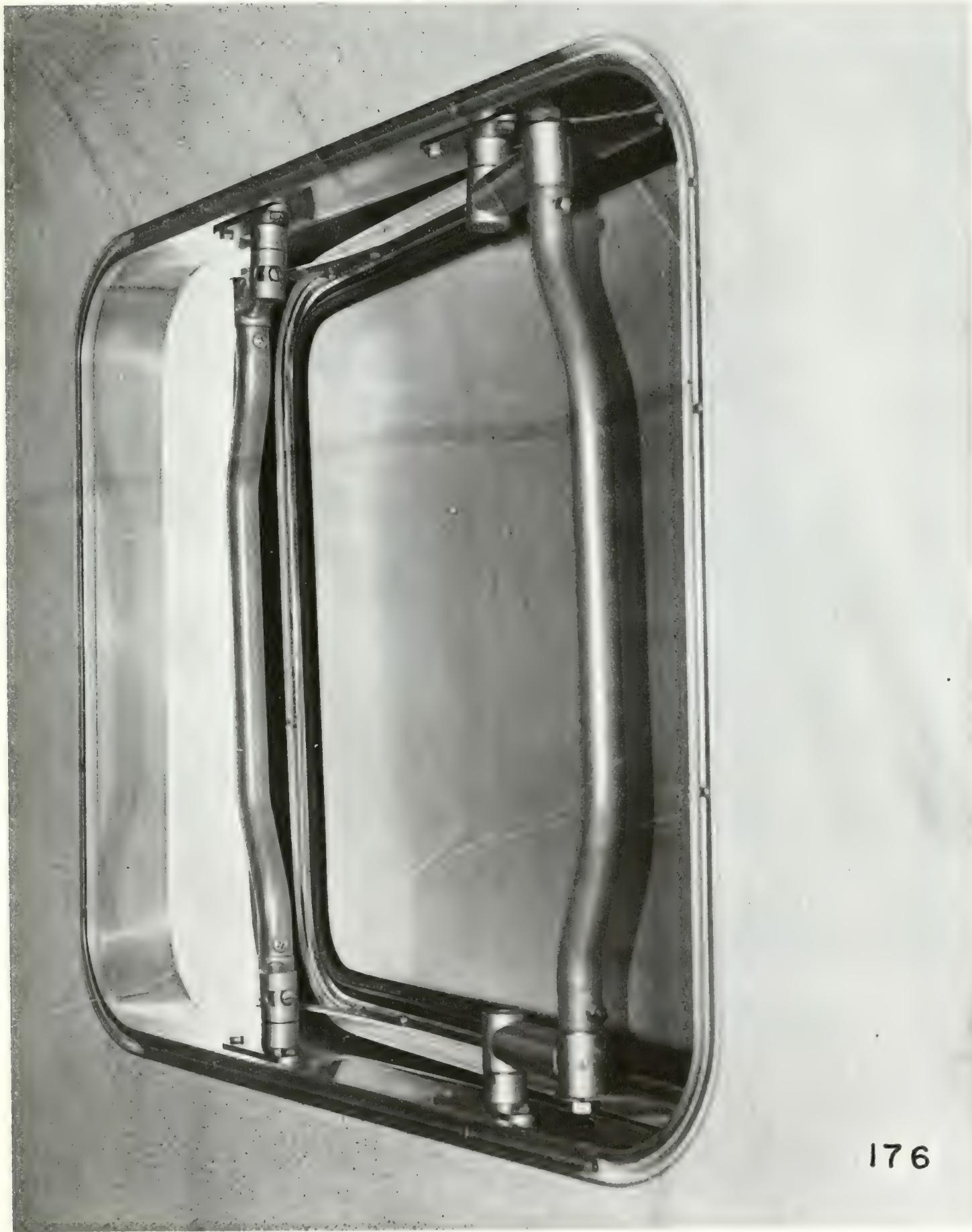


HANDLE OUT
TO
COVER TO
OUTLET



174

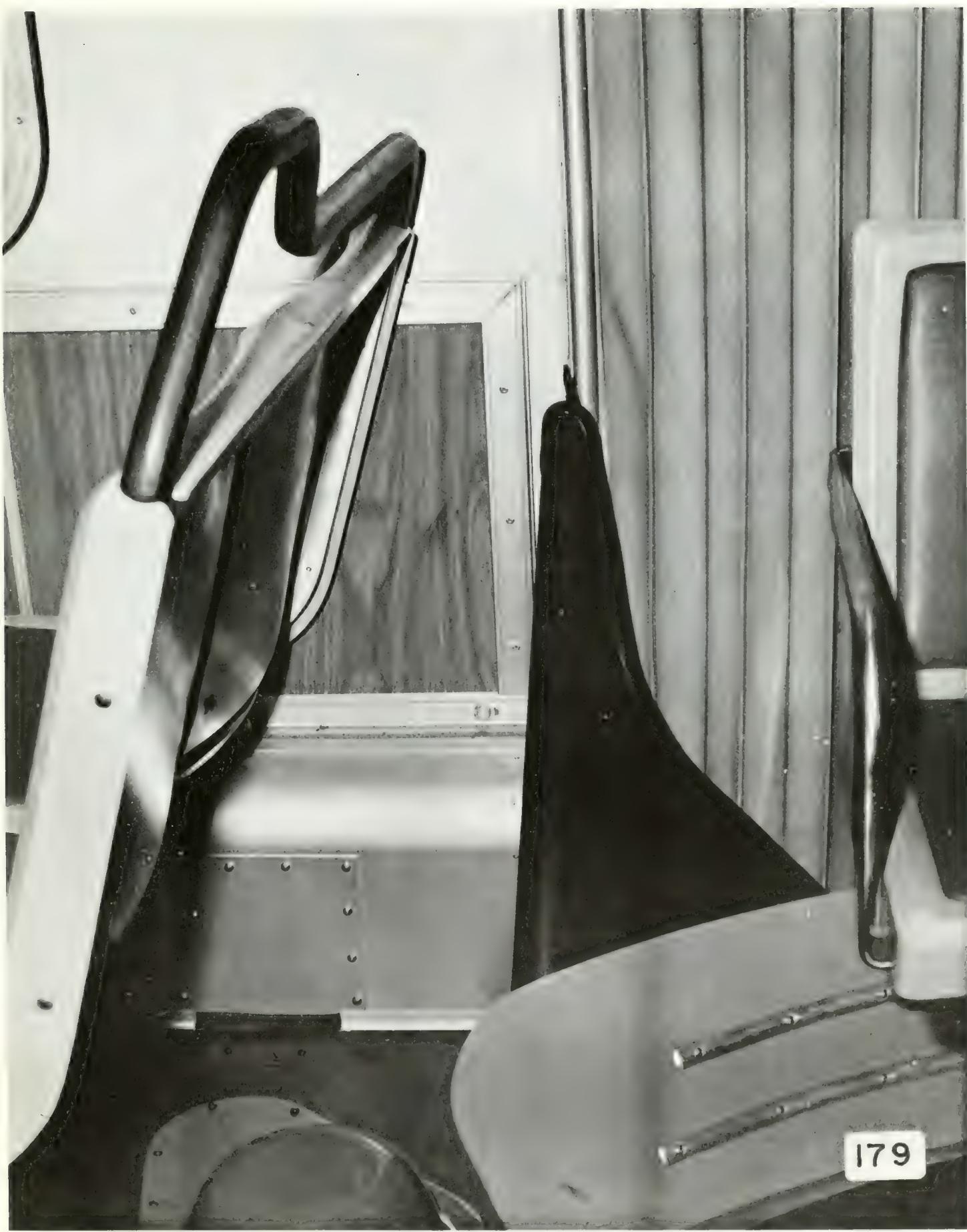


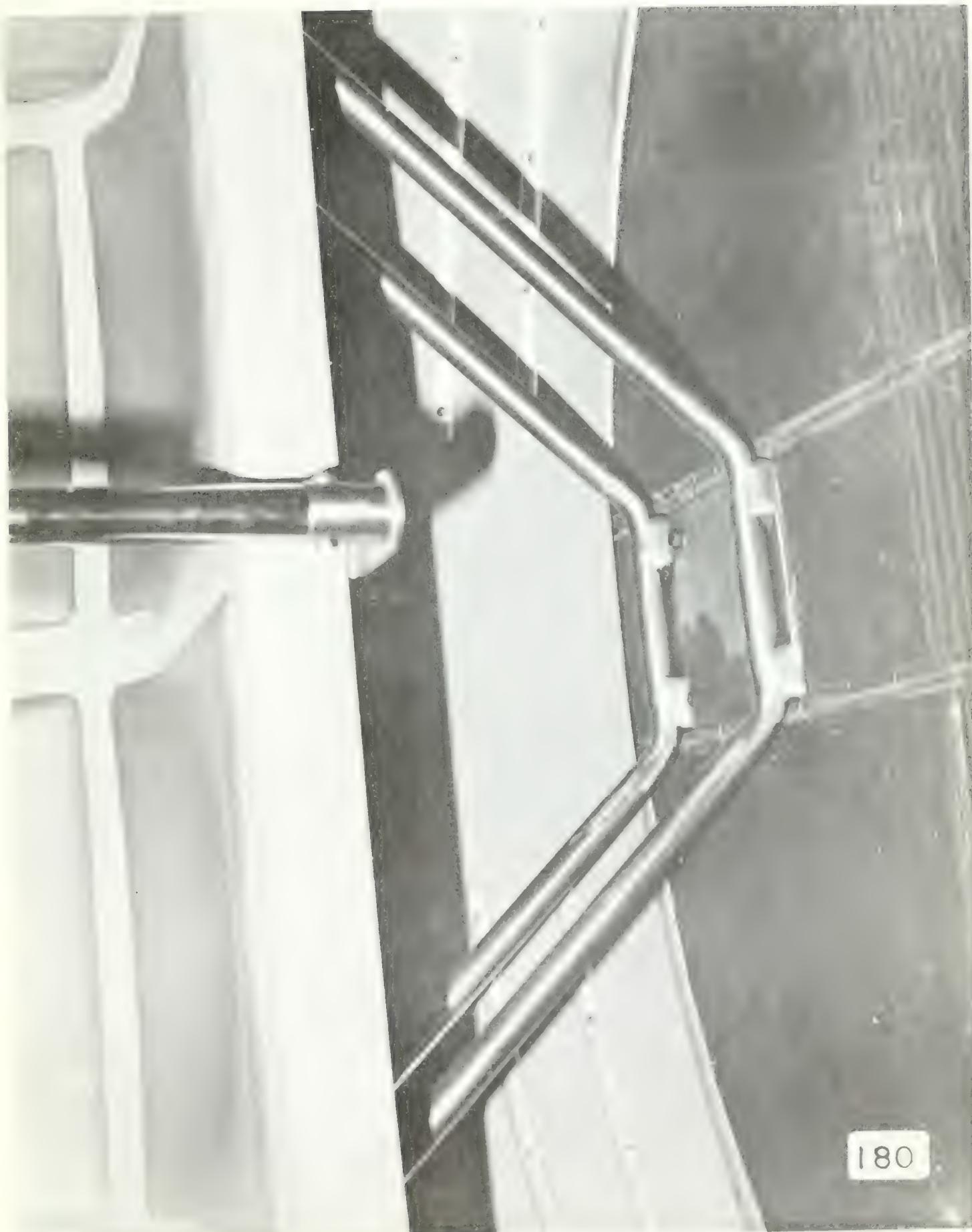


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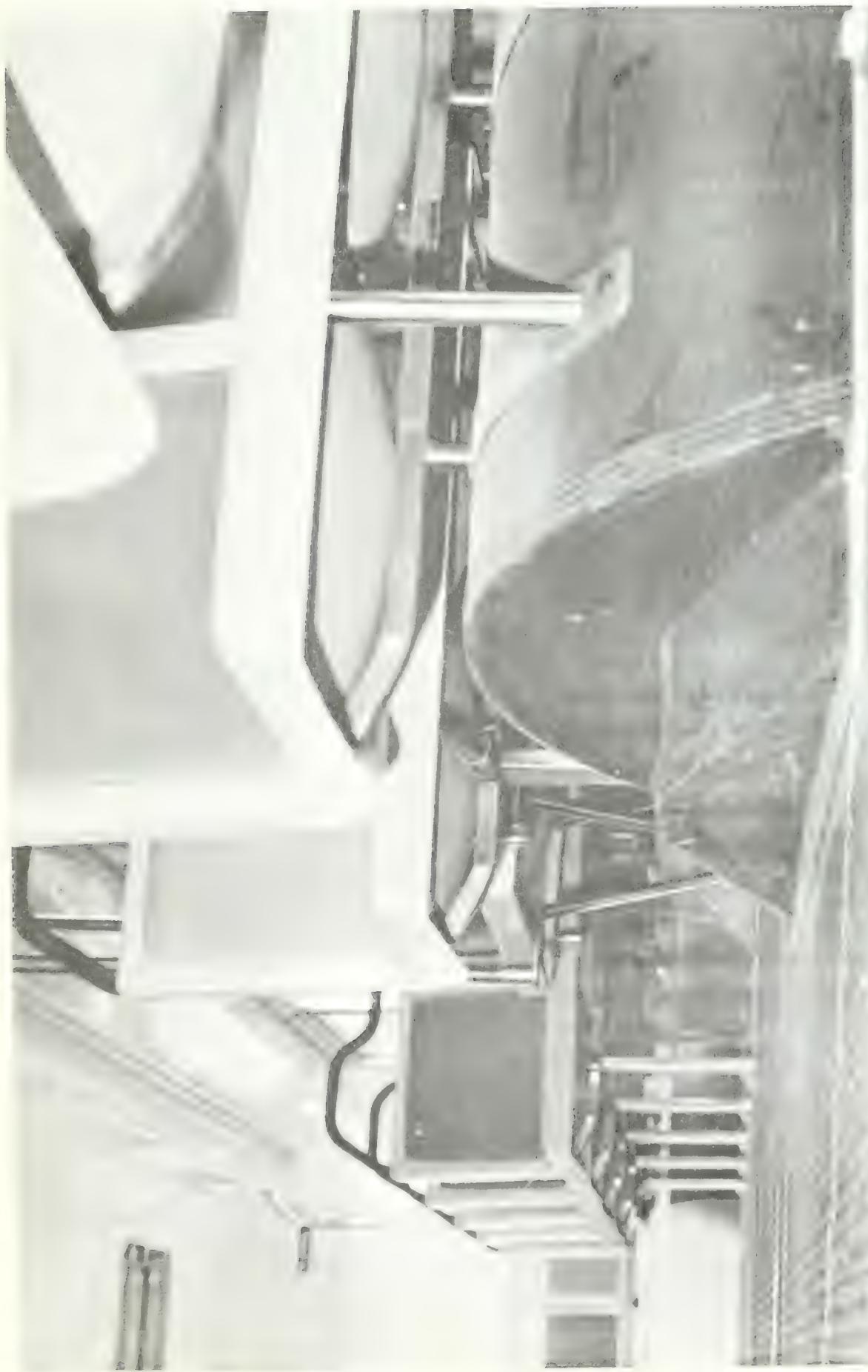








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7002

No smoking
Prohibido fumar

187

No smoking

Violators subject to fine of up to \$200

Prohibido fumar

Multa: hasta \$200

7002



7002

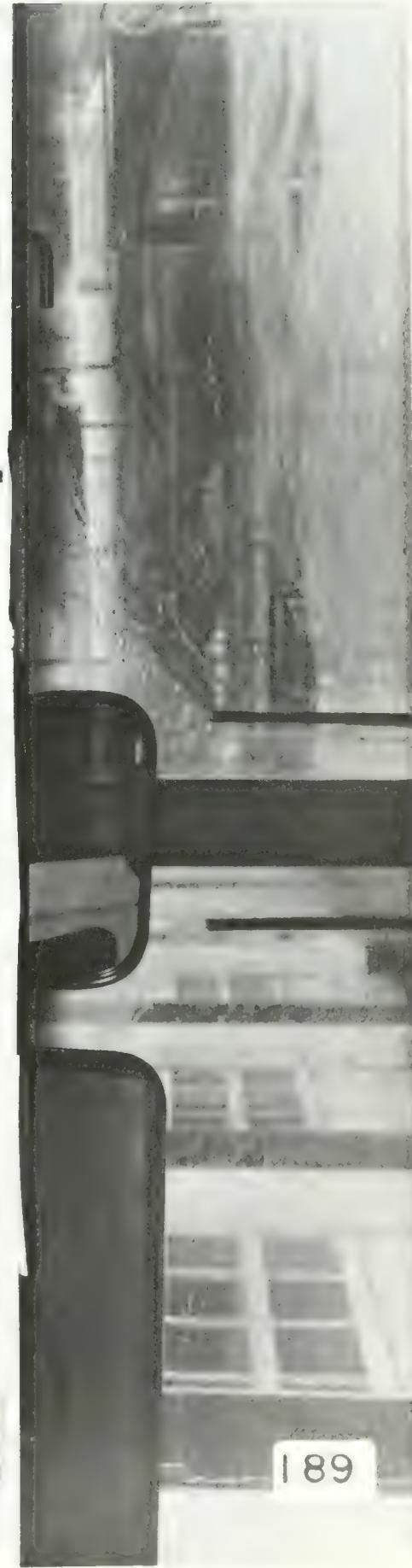
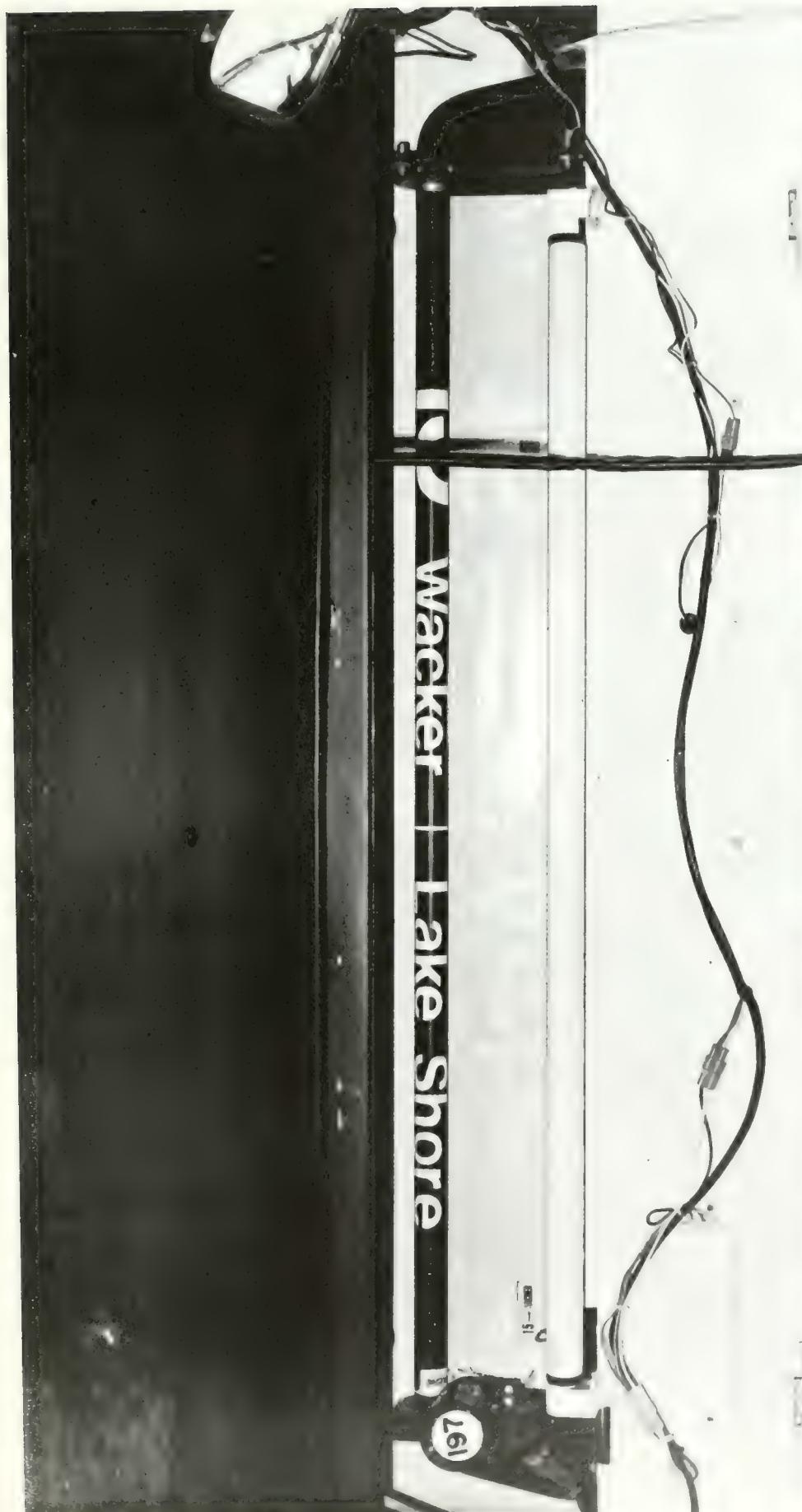
No smoking

Violations subject to fine of up to \$3000

Prohibido fumar

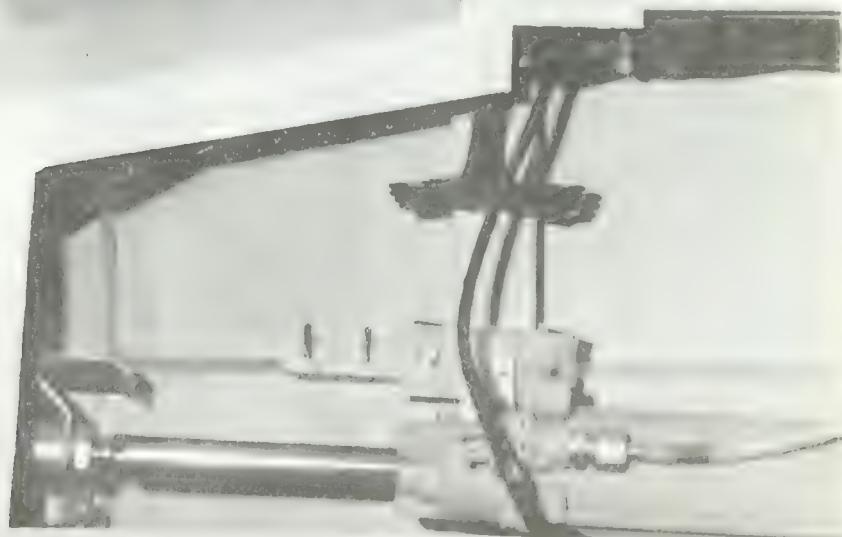
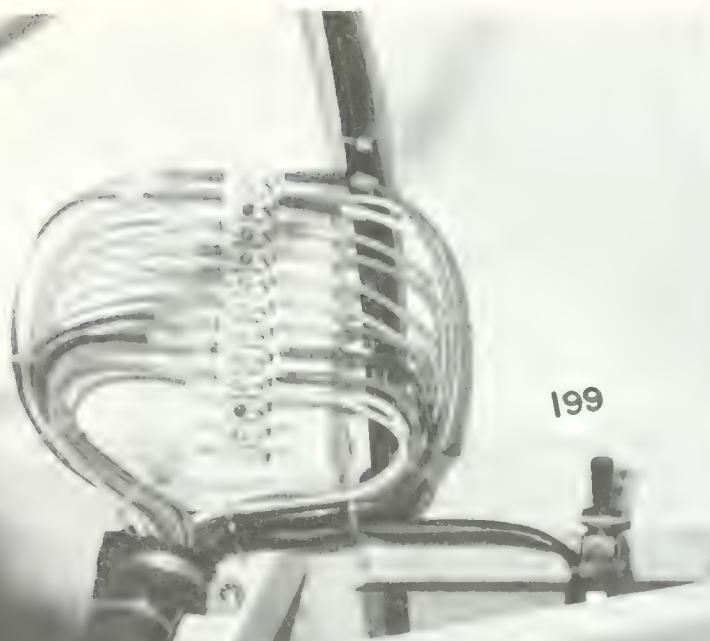
Multa: hasta por \$3000



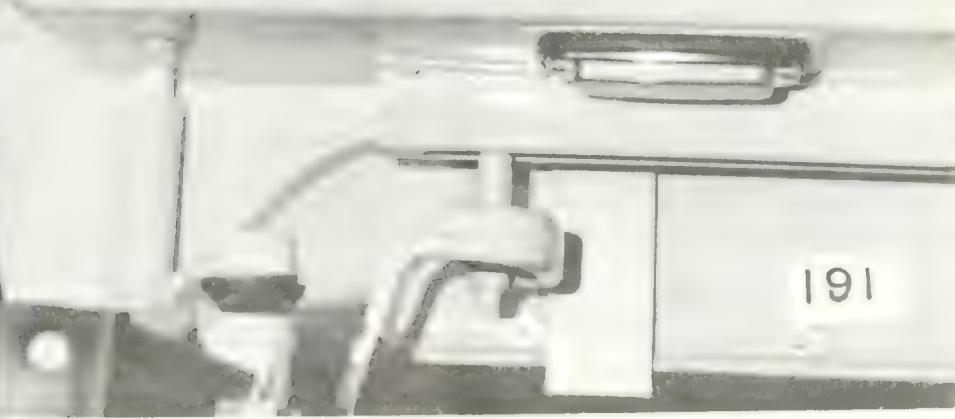




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192

EMERGENCY
TURN HANDLE
COUNTER CLOCKWISE

205

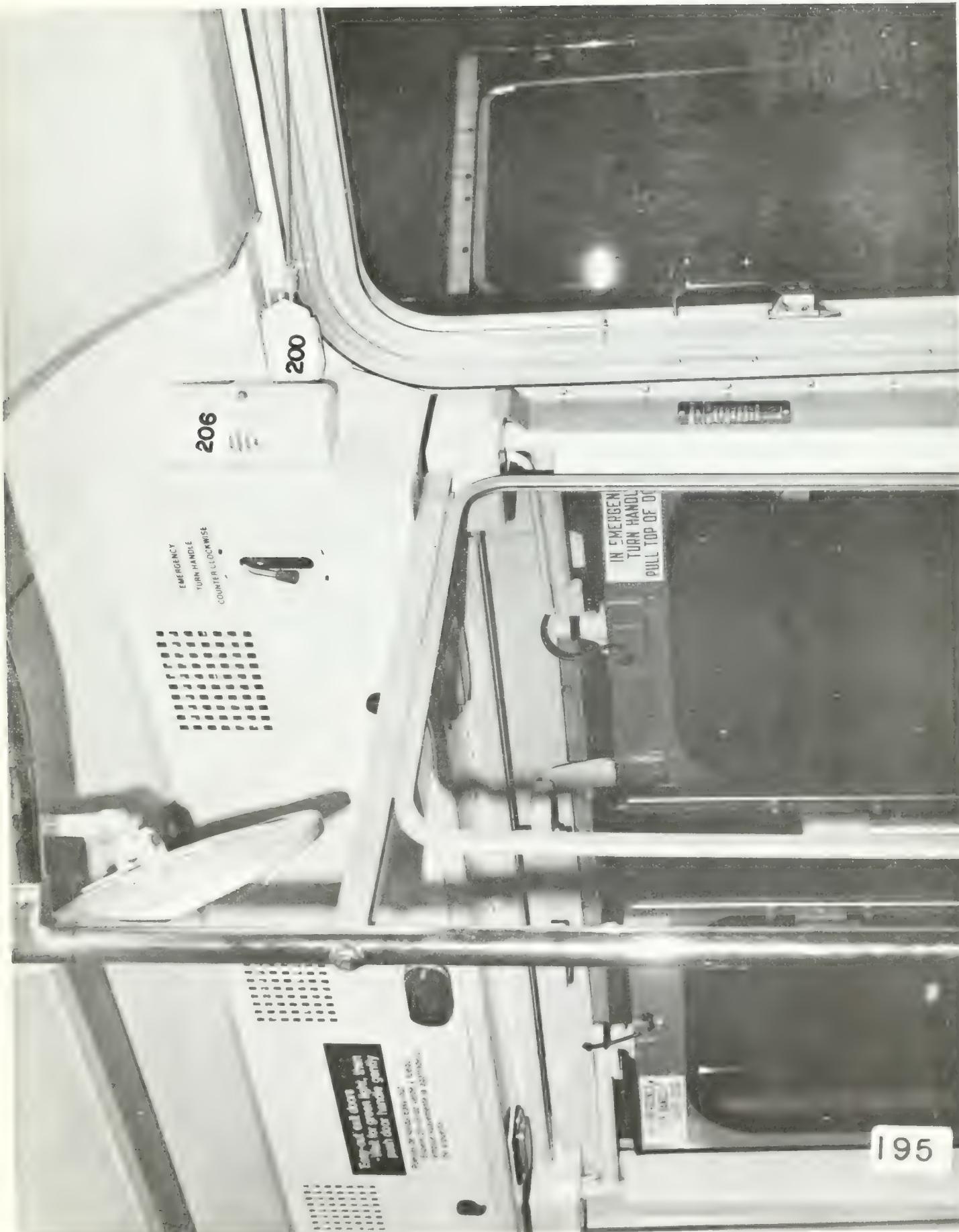
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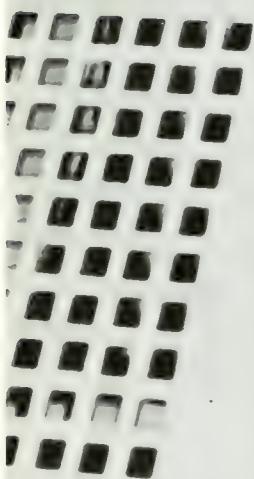
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207

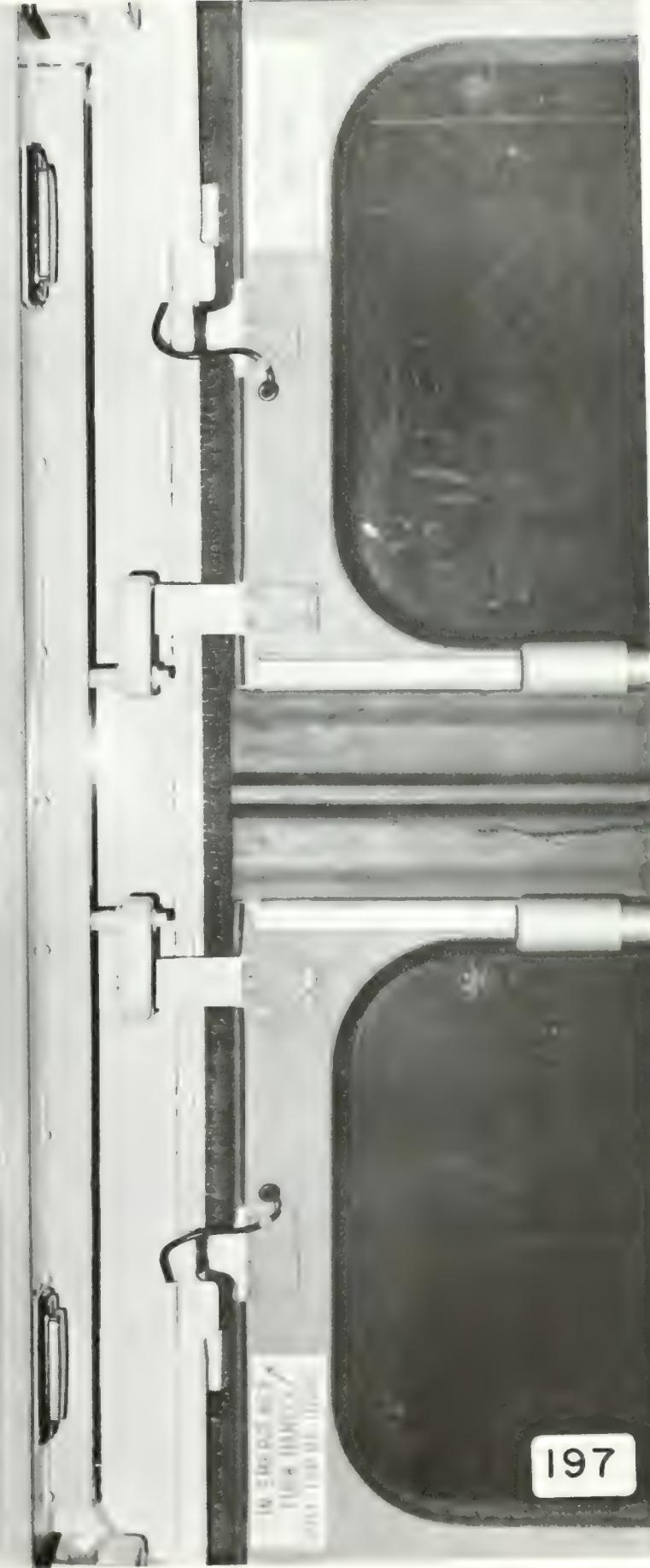


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'Easy-out' exit doors
- Wait for green light, then
push door handle gently

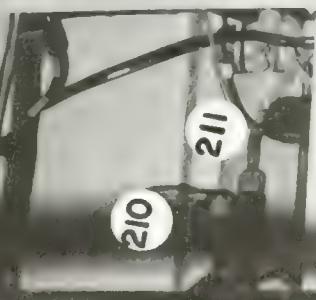
Puertas de salida 'Easy-out'
-Espere por la luz verde y luego
empuje suavemente la agarradera
de la puerta

208

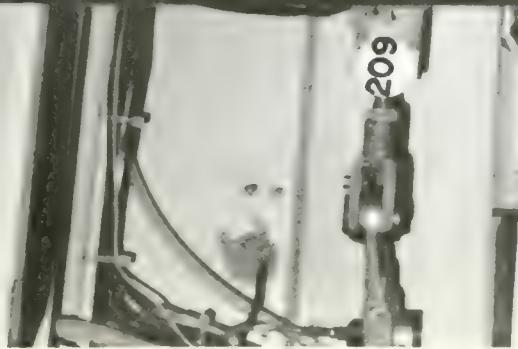


197

216 217 218 219 220 221 222 223

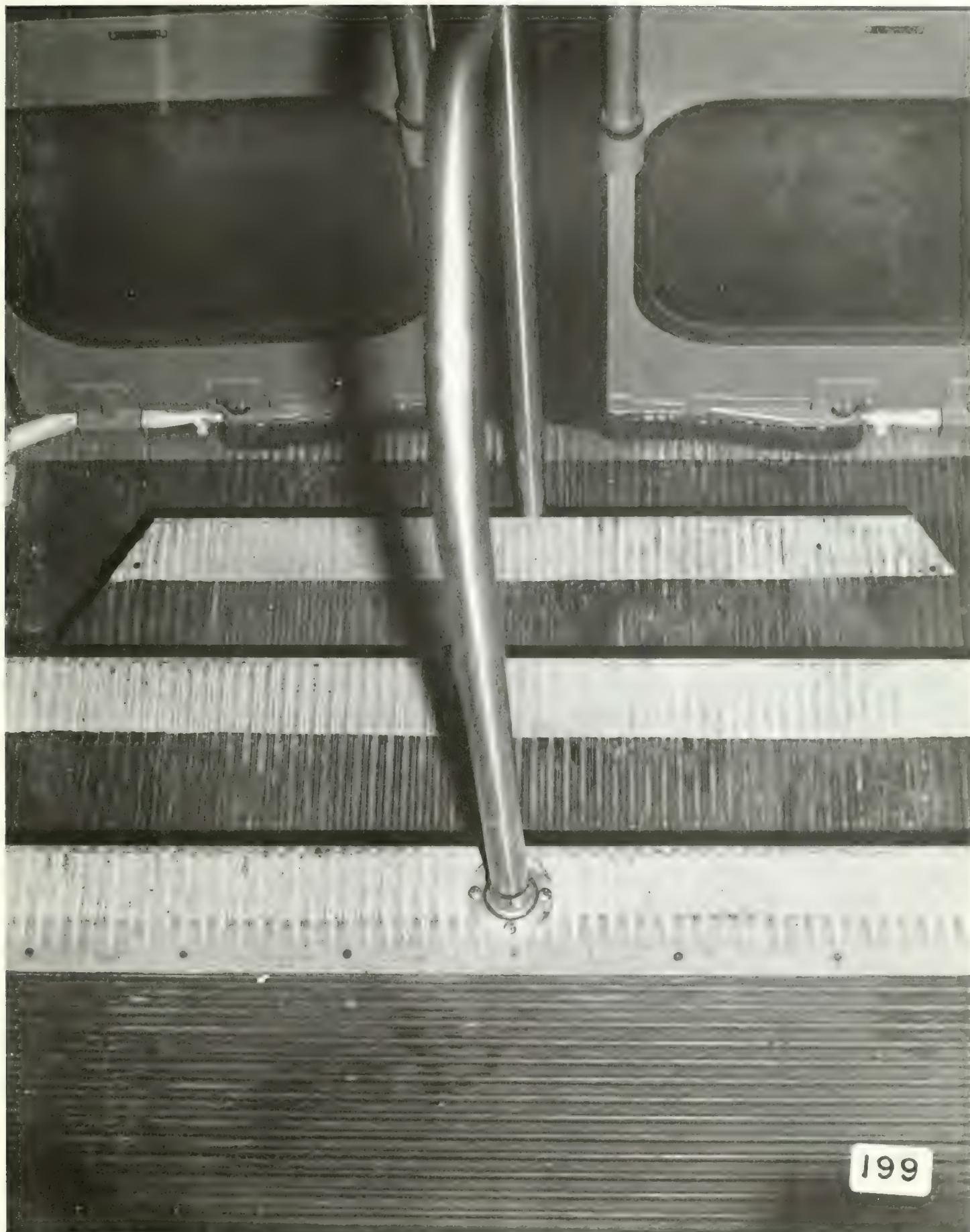


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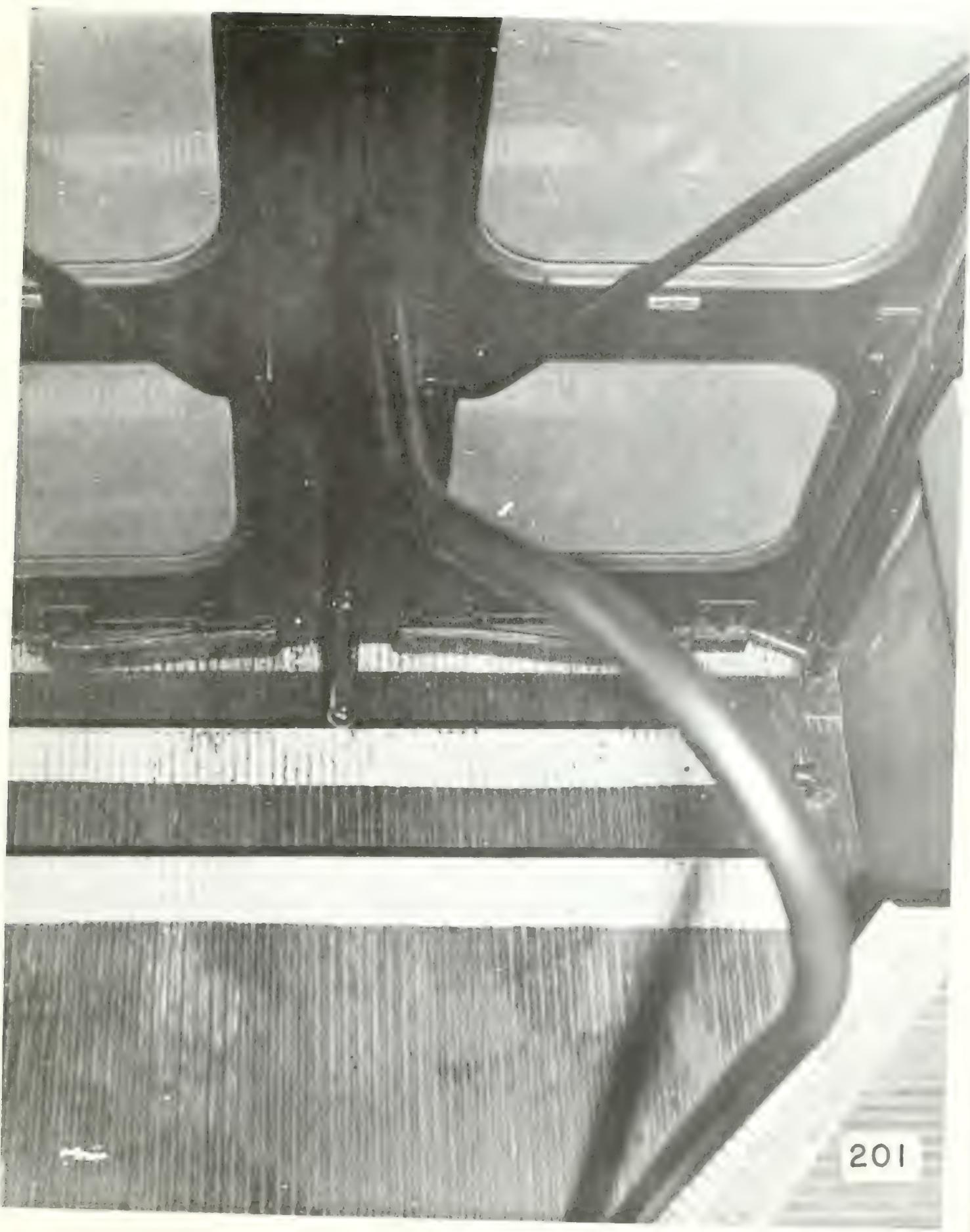


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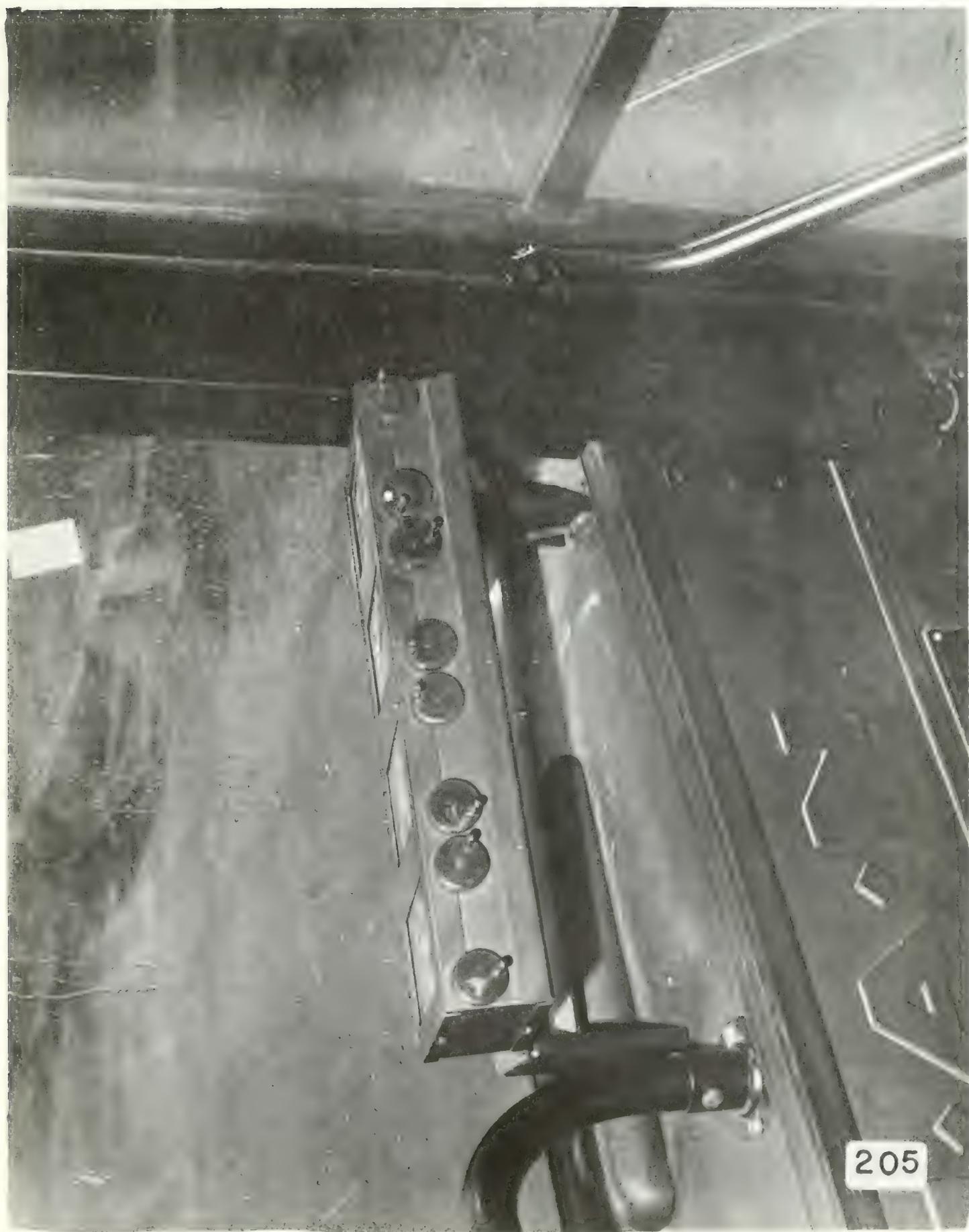


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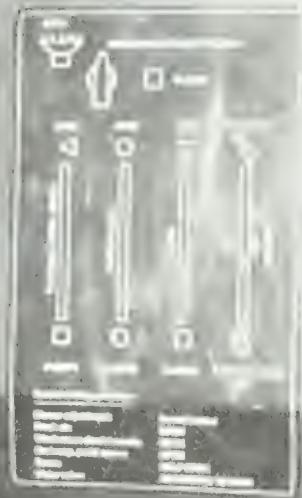
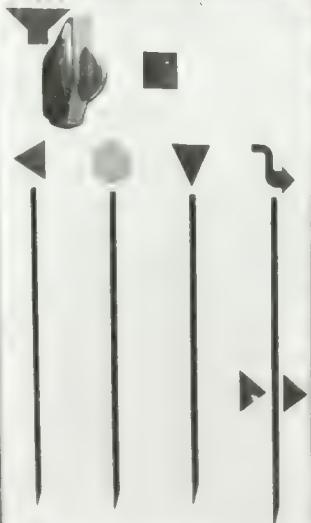




205



DEFROSTER
CONTROLS





230

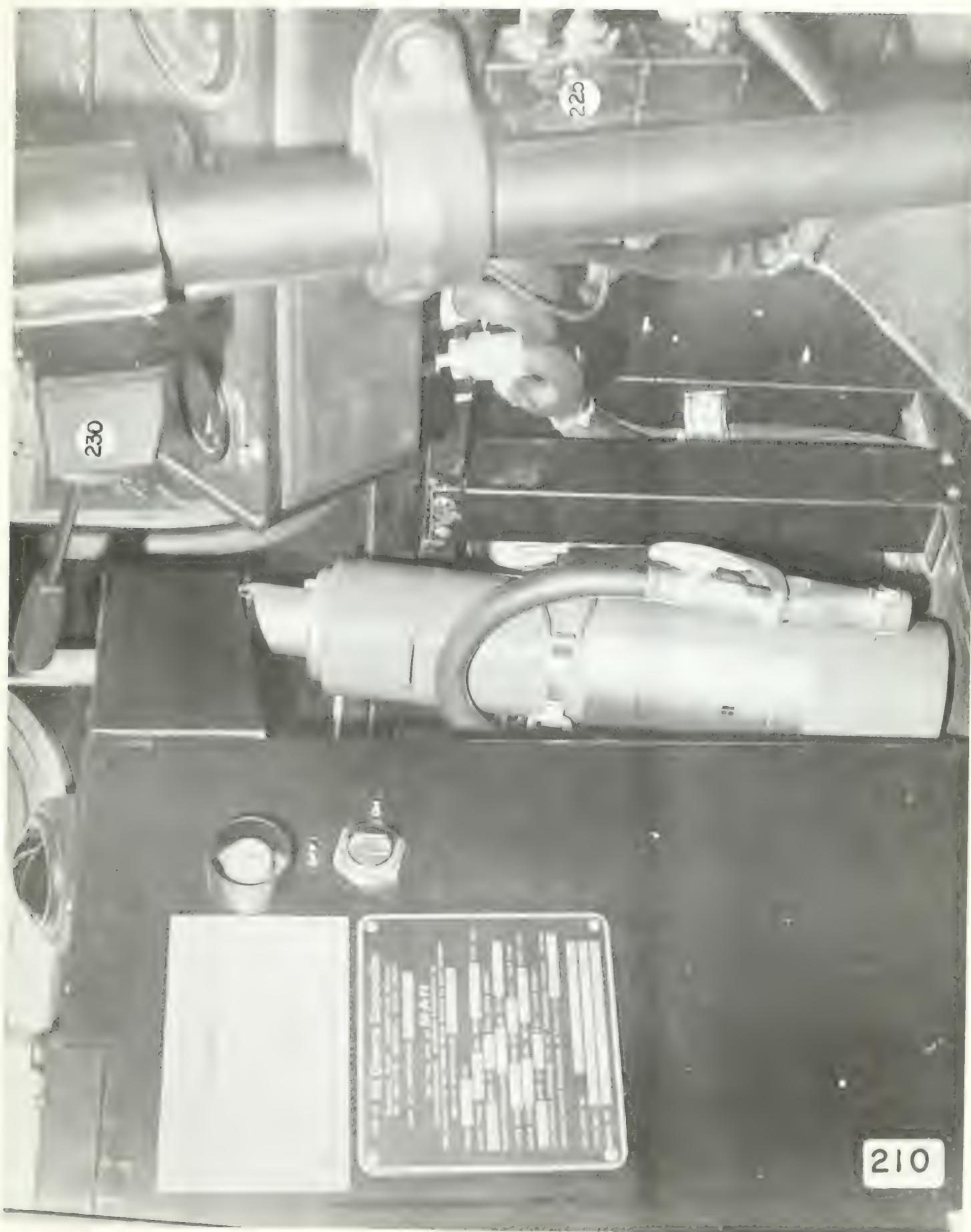
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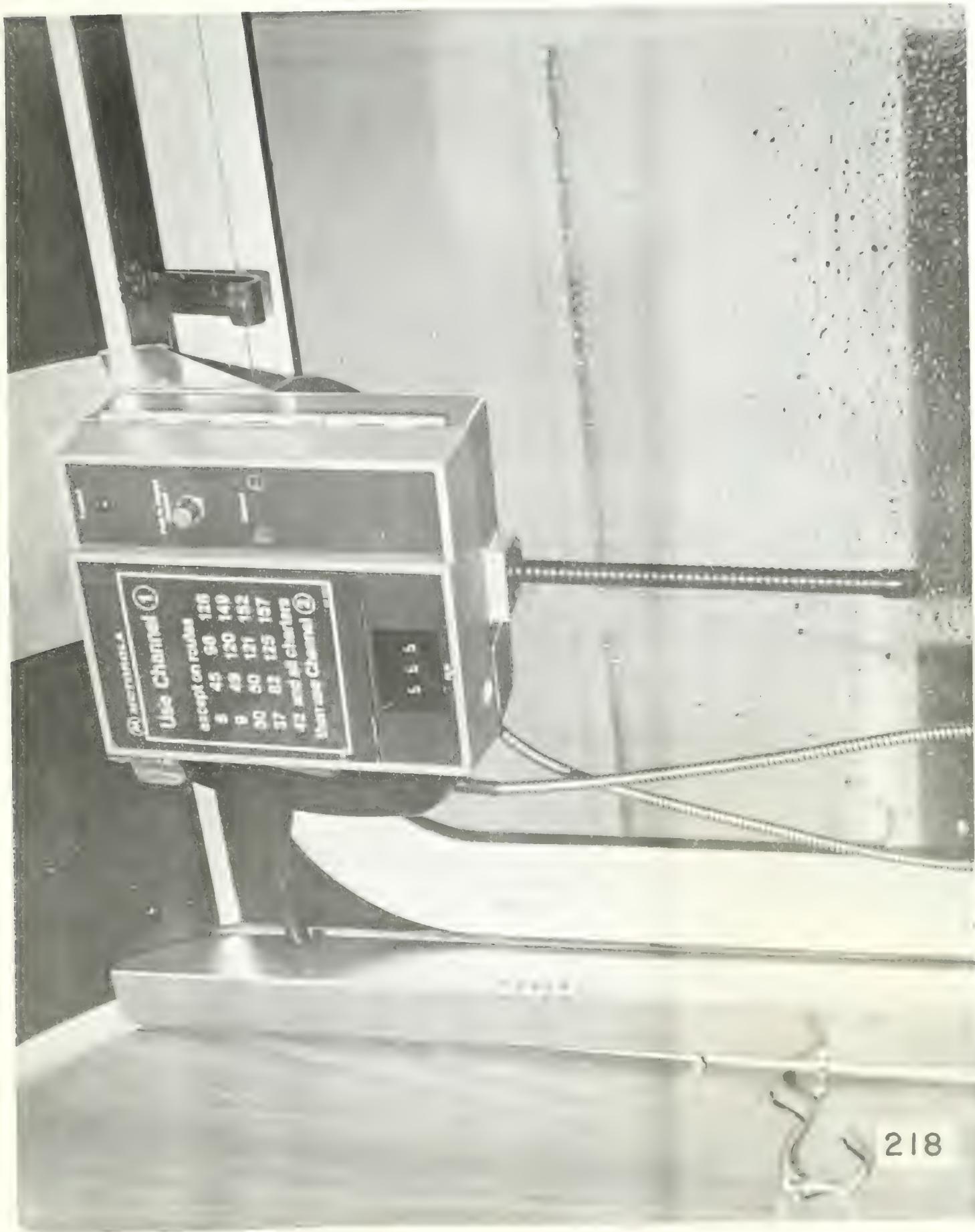


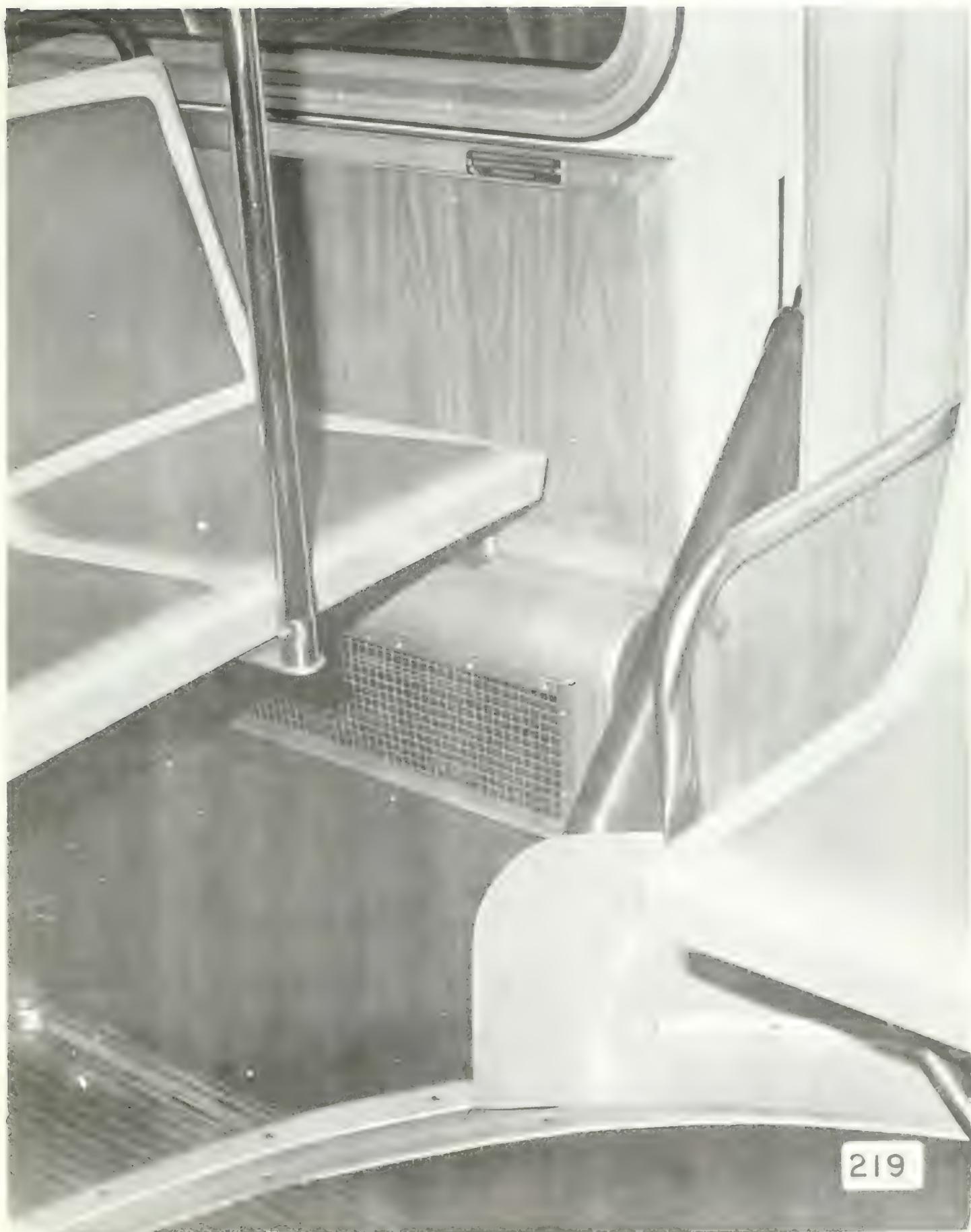
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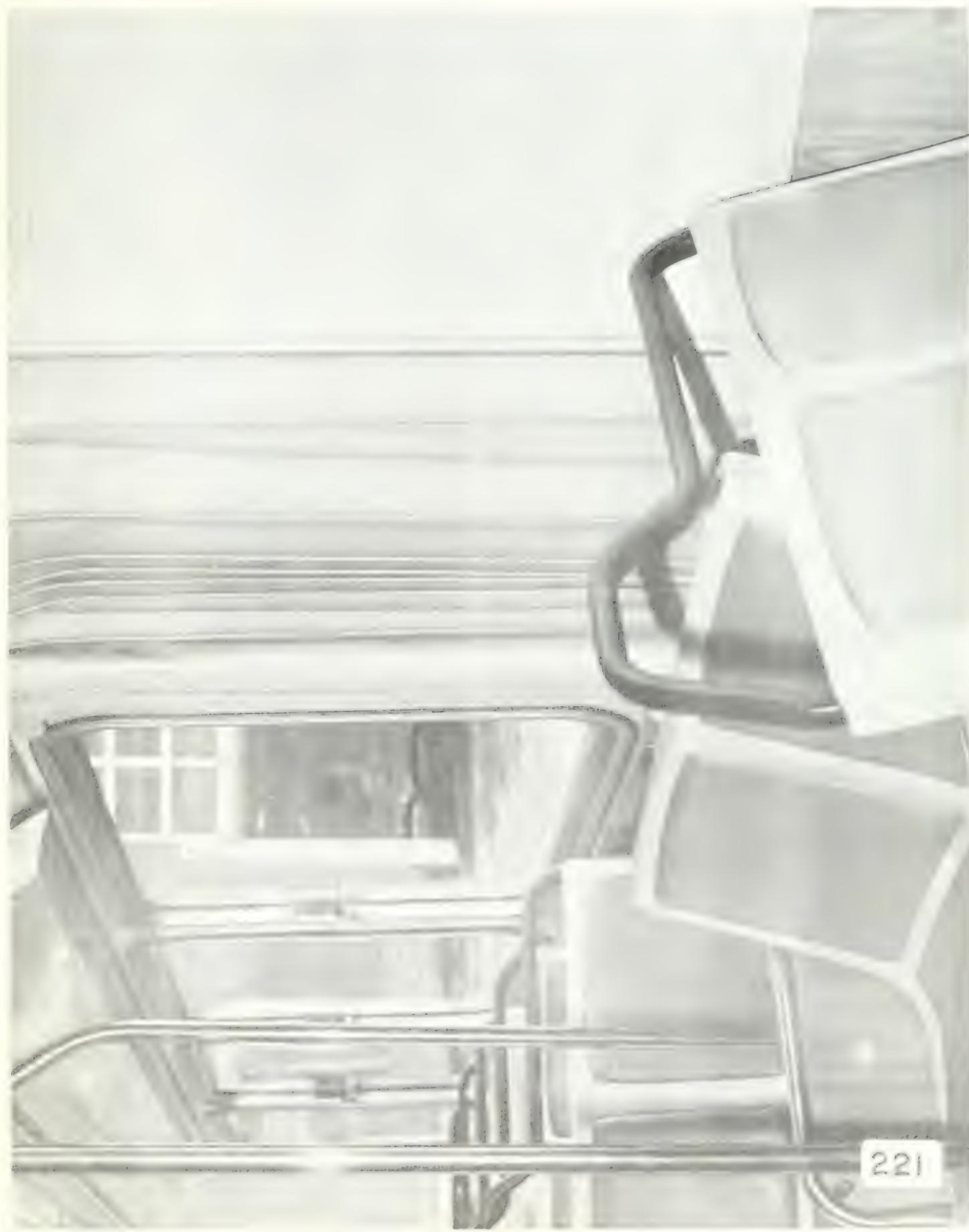








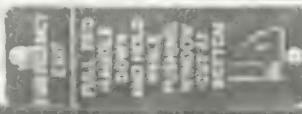
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NUMERICAL INDEX OF COMPONENTS

ARTICULATED BUSES - SERIES 7000-7019

ITEM
NUMBER

PHOTO #2

1. Alcohol evaporator for air system
2. Defroster heater coolant return line
3. Defroster heater coolant supply line
4. Defroster heater core air vent valve
5. Transmission kick down micro switch
6. Accelerator linkage
7. Service brake application valve with transmission retarder micro switches
8. Power steering gear assembly

PHOTO #3

9. Air conditioning hour meter
10. Air conditioning ambient temperature switch

PHOTO #4

11. Head lamp voltage resistor

PHOTO #6

12. Horn right side of coach

PHOTO #14

13. Transmission printed circuit control box
14. Turn indicator flasher unit
15. Hot engine coolant warning switch
16. Driver's air tube to console air outlet

NUMERICAL INDEX OF COMPONENTS
(Continued)

ITEM
NUMBER

PHOTOS #16 - 17

17. Engine oil filler pipe
18. Engine oil level dip stick

PHOTO #18

19. Battery equalizer
20. Voltage regulator
21. Webasto heater control relays and switches
22. Engine starter motor relay
23. Heater box blower motors 160 amp master circuit breaker

PHOTOS #19 - 20

24. Webasto heater controls
25. Combustion chamber and water jacket
26. Webasto heater fuel filter

PHOTO #36

27. Power steering lines from reservoir
28. Engine emergency shutdown solenoid
29. Manual fuel pump
30. Engine fuel filters
31. Engine air intake to filters
32. Engine air filters
33. Engine air filter restriction indicator

PHOTO #38

34. Power steering oil reservoir
35. Engine coolant filler pipe
36. Engine coolant automatic pressure relief valve

PHOTO #44

37. Location of A/C engine oil cleaner
38. A/C Refrigerant compressor
39. A/C Engine final fuel filter
40. A/C Refrigerant compressor high head pressure switch
41. A/C Maintenance free batteries

NUMERICAL INDEX OF COMPONENTS
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ITEM
NUMBER PHOTO #55

42. Front axle brake reservoir
43. Front axle brake reservoir
44. Drive axle brake reservoir

PHOTO #56

45. Leveling valve, right side drive axle

PHOTO #57

46. Leveling valve, left side drive axle

PHOTO #59

47. Heater coolant return from trailer
48. Heater coolant supply line to trailer

PHOTO #61

49. Air conditioning alternator
50. Air conditioning alternator voltage regulator
51. Air conditioning engine fuel pump
52. Air conditioning refrigerant hot gas by pass valve
53. Air conditioning primary fuel filter
54. Air conditioning engine air filter restriction indicator

PHOTOS #66 - 67 - 68

55. Refrigerant condenser core
56. Air conditioning Perkins engine coolant radiator

PHOTO #69

57. Hot engine shutdown switch
58. Speed sensor
59. Sixty (60) second time delay
60. CR2 Solenoid switch
61. CR3 Solenoid switch
62. PR2 Solenoid switch
63. ARI Relay
64. CRI Relay
65. CR4 Relay
66. CR5 Relay
67. CR6 Relay
68. Ten (10) second time delay
69. Coolant automatic pressure relief valve

NUMERICAL INDEX OF COMPONENTS
(Continued)

ITEM
NUMBER

PHOTO #71

70. Coolant reservoir fill cap

PHOTO #73

71. Air line to service brake chamber

72. Park brake release air line

73. Air line to service brake with psi check point

PHOTO #75

74. Pressure protection valve

75. Drive shaft U joint

76. Service brake stoplight switch

PHOTOS #76- 77

77. Service brake chamber

78. Spring applied park brake chamber

PHOTO #78

79. Left side leveling valve link

80. Right side leveling valve link

PHOTO #79

81. Shock absorber, right side drive axle

PHOTO #80

82. Shock absorber, left side drive axle

PHOTO #83

83. Trailer steering drag link

PHOTO #86

84. Trailer, left side air suspension air reservoir

PHOTO #88

85. Leveling valve, right side trailer

86. Leveling valve link

PHOTO #89

87. Trailer, right side air suspension reservoir

NUMERICAL INDEX OF COMPONENTS
(Continued)

ITEM
NUMBER PHOTO #90

88. Leveling valve
89. Leveling valve link

PHOTO #93

90. Power steering unit
91. Power steering pressure check point
92. Park brake warning light switch
93. Front air pressure warning indicator light switch
94. Rear air pressure warning indicator light switch

PHOTO #94

95. Micro switch with actuating ramps

PHOTO #95

96. Driver's light wiring

PHOTO #100

97. Shock mounting bracket, left side tractor
98. Access holes to air suspension retaining nuts, left side

PHOTO #102

99. Shock mounting bracket, right side tractor
100. Access holes to air suspension retaining nuts, right side

PHOTO #104

101. Fresh and recirculated air inlet opening

PHOTO #105

102. Fuel tank access

PHOTO #106

103. Location of driver's air blower

PHOTO #107

104. Belt driven air compressor
105. Belt tension adjusting idler pulley
106. Engine coolant fan
107. Radiator and fan shroud

NUMERICAL INDEX OF COMPONENTS
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ITEM
NUMBER

PHOTO #108

108. Gear driven air compressor
00. Power steering pump

PHOTO #109

109. Engine crankcase breather
110. Engine oil pressure temperature gauge and compartment light switch
111. Engine shutdown cylinder
112. Final engine fuel filter
113. Engine fuel injection pump
114. Fuel lines to engine cold start plugs
115. Refrigerant low and high pressure lines

PHOTOS #112 - 113

116. Transmission breather and fill cap
117. Transmission oil level dip stick
118. Transmission oil filter

PHOTO #117

119. A/C Engine fuel supply line shut-off valve
120. A/C Engine fuel return line shut-off valve

PHOTO #118

121. Muffler heat baffle

PHOTO #122

122. Trailer steering drag link
123. Refrigerant suction line
124. Refrigerant pressure line
125. Cover trailer modulating valve

PHOTO #126

126. Tractor, front axle brake load proportioning valve
127. Pressure protection valve
128. Automatic moisture ejecting valve
129. Four circuit protection valve
130. One-way check valve
131. Supply air reservoir
132. Accessory reservoir
133. Drive axle brake reservoir

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ITEM
NUMBER

PHOTO #127

134. Horizontal hinge angle brake switch
135. Pressure limiting valve
136. Drive axle wishbone support

PHOTO #128

137. Tractor modulator valve

PHOTO #129

138. Pressure regulator for heater box motor rpm

PHOTO #131

139. Trailer axle brake load proportioning valve
140. Trailer brake air reservoir
141. Trailer suspension air reservoir
142. Accessory air reservoir

PHOTO #132

143. Marine pump
144. Heater box
145. Heater box blower motor

PHOTO #133

146. Modulating valve trailer
147. Fuel tank

PHOTO #134

148. Trailer steering linkage reversing lever

PHOTO #135

149. Heater supply and return coolant lines
150. Refrigerant suction and pressure lines

PHOTO #136

151. Cable and turnbuckle for securing bellows to coach

PHOTO #137

152. Manual drain valve

NUMERICAL INDEX OF COMPONENTS
(Continued)

ITEM
NUMBER

PHOTO #139

153. Muffler location for unloader
154. Air compressor unloader valve

PHOTO #140

155. Stoplight switch horizontal hinge angle

PHOTO #141

156. Drive axle quick release relay valve, right side
157. Drive axle quick release relay valve, left side
158. Trailer brake control valve
159. Drive axle brake loading proportioning valve

PHOTO #142

160. Air filter main air line
161. Pressure charging valve

PHOTO #147

162. Rod assembly locating
163. Arm locating

PHOTO #148

164. Warning and brake application ramps
165. Warning switch
166. Brake application switch
167. Ball joint assembly carrier

PHOTO #150

168. Junction box, electrical

PHOTO #151

169. Battery box
170. Voltage regulator compartment

PHOTO #153

171. Alternator
172. 105° temperature switch

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NUMBER

PHOTO #154

173. Speedometer cable drive
174. Transmission oil heat exchanger
175. Transmission assembly

PHOTO #155

176. Oil pressure gauge switch
177. Starter protection oil switch
178. Engine turbo charger
179. Engine oil heat exchanger
180. Engine starting motor

PHOTO #156

181. Muffler
182. Tailpipe

PHOTO #157

183. Air compressor unloading valve muffler

PHOTO #158

184. Service brake stoplight switch

PHOTO #159

185. Engine cold start plugs

PHOTOS #161 - 162

186. Coolant temperature gauge switch
187. Radiator fan control switch
188. Coolant overheat warning switch
189. Engine thermostat
190. Engine compartment light
191. Engine oil filter

PHOTO #164

192. Grad-U-stat

PHOTO #169

193. Sign curtain control motor
194. Motor control switch

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ITEM
NUMBER

PHOTO #177

195. Suspension nut undercover
196. Shock bracket cover

PHOTO #190

197. Front destination sign curtain motor
198. Voice page speaker

PHOTO #191

199. Door master switch

PHOTO #192

200. Passenger chime signal switch

PHOTO #194

201. Stepwell and curb light
202. Door control mag valve
203. Stepwell and curb lights
204. Door operating cylinder
205. Emergency door opening air release valve

PHOTO #195

206. Passenger chime and switch

PHOTO #196

207. Cam switch

PHOTO #197

208. Passenger signal light indicating doors unlocked

PHOTO #198

209. Forward door leaf operating cylinder
210. Sensitive edge pressure switch
211. Sensitive edge switch
212. Stepwell and curb light switch
213. Mag valve
214. Stepwell and curb light switch
215. AFT door leaf operating cylinder
216. By-pass relay
217. Door opening hold relay

NUMERICAL INDEX OF COMPONENTS
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ITEM
NUMBER

PHOTO #198 - Cont'd.

- 218. Touch bar relay
- 219. Sensitive edge alarm relay
- 220. Alarm cut-out relay
- 221. Sensitive edge relay
- 222. Door fully open relay
- 223. Door fully open relay
- 224. Emergency door opening release valve

PHOTO #208

- 225. Park valve emergency release valve

PHOTO #209

- 226. Silent alarm switch
- 227. Entrance door dump valve
- 228. Fire extinguisher bracket
- 229. Exit door sensitive edge alarm buzzer
- 230. Turn indicator switch

PHOTO #211

- 231. Engine emergency shutdown switch
- 232. A/C engine start switch
- 233. Driver's ceiling light switch
- 234. Interior light switch
- 235. Passenger stop signal switch
- 236. Engine fast idle switch
- 237. Exit door open by-pass switch
- 238. Entrance and exit door leaf control switch
- 239. Webasto heater indicator light
- 240. Warning buzzer for, engine low oil pressure, low air pressure
engine overheat and hinge angle
- 241. Park brake release valve
- 242. Driver's air flow ball
- 243. Entrance and exit door control valve

PHOTO #213

- 244. Adjustable air flow heat duct
- 245. Head lamp dimmer switch
- 246. Speedometer cable

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